The Transnational Management of Hazardous and Radioactive Wastes

BY ELLI LOUKA

Orville H. Schell, Jr. Center
for International Human Rights
at Yale Law School

Occasional Paper Number 1

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Designed by Christine Celano Cooney.
Set in MBembo and Univers 45 on a Macintosh IIci by Sally Peterson at Yale Law School.

Printed in the United States of America.

To my teacher,
Michael Reisman

Contents

Preface

The decision of the Orville H. Schell Center for International Human Rights to launch its Occasional Papers Series with *The Transnational Management of Hazardous and Radioactive Wastes* may strike some readers as rather curious. In fact, however, it is entirely consistent with our vision of the center as a promoter of interdisciplinary research that contributes meaningfully to evolving notions of human rights in a rapidly changing world.

Scholars have come to speak of various *generations* of international human rights concerns. The first generation of rights includes those often referred to as political and civil rights, such as freedom of speech, press and religion, procedural due process, and the right to participate in the political process. The International Covenant on Civil and Political Rights best exemplifies this focus. The second generation emphasizes economic and social rights, concerned that people have the wherewithal—such as education, employment, healthcare, and housing—to make effective use of their first generation rights. The International Covenant on Economic, Social, and Cultural Rights embodies these considerations.

Of course, talk of *generations* of rights should not lead anyone to think that the world, as a whole, has passed through one generation, is experiencing a second, and is likely to move on to a third. Clearly, many millions of people have yet to enjoy any of the first-generation rights. Moreover, only a small minority of the wealthiest, industrialized nations have been able to afford their citizens the second-generation bundle of rights.

Nevertheless, the conversation has turned recently to a consideration of third-generation rights that include concern for the environment, development, and peace. The Stockholm Declaration, adopted by the United Nations Conference on the Environment in 1972, represented one of the earliest recognitions of the nexus between human rights and "an environment of quality."

Third-generation human rights are by definition transnational in that their enjoyment necessitates regional, if not global, action. For example, no one nation can expect to maintain a healthful environment—clean air and clean water—for very long unless its neighbors cooperate in efforts to prevent or remedy various forms of pollution. In addition, the degree to which multinational efforts to protect the environment are successful will affect profoundly the nature and quality of first- and second-generation rights available to inhabitants of those states.

Elli Louka's excellent study of the threats posed by unregulated dumping of toxic nuclear and non-nuclear wastes makes an important contribution to our understanding of the need for action on third-generation rights today rather than tomorrow. Her proposals for reform offer every reason to believe that this can be done in ways that preserve both the environment and opportunities for rational development. The Schell Center, consequently, takes great pride in helping Ms. Louka's insights reach the widest possible audience.

Acknowledgments

This monograph would never have been written without the support and encouragement of my teacher, Professor Michael Reisman. I thank him for his time, patience, and insights. I would also like to thank Professor Myres McDougal for the numerous enlightening discussions.

I am grateful to the Marangopoulos Foundation for Human Rights, and specifically to its president, Professor Alice Yotopoulos-Marangopoulos, and to the Orville H. Schell, Jr. Center for International Human Rights at Yale Law School for funding this project. Many thanks to Dr. George Andreopoulos and Professor Drew Days for their generous assistance from the preliminary stages all through the publication of the monograph.

Many thanks to Professors Jules Coleman, Donald Elliott, and Carol Rose for their comments on an earlier draft.

My friend Ellen Boneparth helped significantly with the U.N. bibliography. The personnel of the Yale Law Library and, especially, Peg Durkin and Dan Wade were equally helpful.

Finally, I would like to thank my parents and my New Haven family, Amy and Surya.

Introduction

The worldwide volume of hazardous wastes generated[1] annually has increased from roughly 5 million metric tons in 1947 to more than 300 million metric tons in 1988.[2] The overwhelming bulk of this material—an estimated 265 million metric tons—was generated by the United States. Western Europe produced another 35 million metric tons. At the same time, the costs of disposal have risen as a result of more stringent regulations, in some cases exceeding $2,000 a ton.[3] For this reason, industries in these countries have started exporting their wastes to countries with less stringent legislation and correspondingly lower disposal costs. Most often, the destination is developing countries.

The volume of waste exported is extensive. Each hour about twelve loads of hazardous wastes cross national frontiers somewhere in Western Europe,[4] and there were approximately 100,000 cross-border transports involving 2.2 million tons of waste during 1983 in Western Europe.[5] Overall, more than 5,000 transports occurred in North America.[6] In other words, in the Organization of Economic Cooperation and Development (OECD) area, a cargo of hazardous wastes crosses national frontiers more than once every five minutes, twenty-four hours a day, 365 days a year.[7] Most of this material is transported by road. Some of it travels by rail.[8]

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As far as the waste trade between developed and developing countries is concerned, it is estimated that the industrialized nations shipped over 3 million tons of hazardous wastes to the Third World between 1986 and 1988.[9]

In addition, while specific figures for the international transport of radioactive wastes do not exist, it has been estimated that over 9 million movements of nuclear cargoes take place each year worldwide.[10]

The central thesis of this monograph is that these recent developments compel a new vision for the international regulation of waste transport. The current regulatory trend is based on prior notification and consent of the importing country, a scheme that is no longer adequate. Instead, it is imperative to create new international monitoring institutions, develop rules for liability and compensation, and redefine "waste." Regulating the transfrontier movements is not sufficient; what is needed is waste management at the transnational level.

This monograph is divided into four chapters. Chapter 1 describes international incidents involving transnational waste movement and describes the reactions of the international community. It also analyzes the premises of a sound international environmental policy, particularly the need to prevent environmental degradation, and to address problems presented by Third World underdevelopment.

Chapter 2 analyzes the shortcomings of the international regime that currently governs the transnational movement of hazardous and radioactive wastes, and emphasizes the need for a coherent policy. Chapter 3 sets forth an alternative policy based upon the guidelines discussed in Chapter 1. According to this policy, the ideal transnational regime should differentiate between product and waste export, create a single regime governing both hazardous and radioactive wastes, and prevent illegal waste trade. In so doing, it should give priority to considerations of safety and sound waste management.

Finally, Chapter 4 sets forth a proposal for an effective international regime. This proposal entails the redefinition of waste to include methods of sound waste management, the establishment of a monitoring agency, and the development of rules of liability, compensation and state responsibility.

I

International Incidents, Appraisal, and Premises of a Coherent International Environmental Policy Preventing Environmental Degradation

Incidents

In June 1988, in the Nigerian port of Koko, drums mislabeled as construction material were found to contain more than 3,000 tons of Italian toxic wastes. The Nigerian authorities seized the ship and arrested twenty people,[1] threatening to execute those responsible. In addition, Nigeria recalled its ambassador from Rome.[2] The Italian government agreed in principle to help remove the wastes, even though it was not the government but private companies that were involved in the dumping.[3]

In the same month, Philadelphia incinerator ash was dumped in Guinea at only a fraction of the price that would have been paid in the United States.[4] The local Guinean firm was paid $40 per ton, while it would have cost $1,000 per ton to dispose of the ash in compliance with the standards set by the U.S. Environmental Protection Agency (EPA).[5] The Norwegian consul general was arrested for his role as middleman. Guinea made it clear that it would hold him as a hostage until Norway retrieved the ash.[6]

Also in 1988, Congo's minister for the environment and other top-ranking officials were arrested for their involvement in two toxic waste dumping deals: one involved 1 million tons of toxic wastes at $37 a ton, from a Liechtenstein-registered firm handling materials generated from Benelux and former West Germany, and the other 1 million tons of solvents and pesticides from a U.S. company.[7]

In same year, Guinea-Bissau was offered $600 million—three times its Gross National Product—to accept toxic wastes shipped by private companies in the United States and Europe.[8]

In July 1989, the waste trading ship Pro Americana returned to Rottendam, its port of origin, loaded with 2,000 tons of toxic wastes from Denmark, Belgium, and Italy. It had been refused in Brazil on the grounds that Brazil was ill-equipped to deal with the wastes in an environmentally sound manner. The Dutch Ministry of the Environment, in turn, sought a court order to have the wastes removed from the port and returned to the original owners. Although Denmark and Belgium initially agreed to take back their shares, Belgium later refused to accept its share, maintaining that it had been mixed with other material, and therefore was no longer Belgium's responsibility. Italy also refused to accept its share. The Dutch firm ultimately responsible for the fate of the wastes will soon face an enormous fine if it cannot dispose of them.[9]

Eastern Europe, and Poland in particular, has also been a target of waste exporters. It has been estimated that "since 1989, 22 million metric tons of toxic waste have been offered to Poland, and over 46,000 tons have crossed the borders."[10]

An Israeli government-owned company plans to build a major waste-importing facility in an old copper mine in the Negev desert. It will accept wastes from a company with headquarters in former West Germany that have already been rejected by Britain and several African countries; in exchange, Israel will obtain some of the recycled aluminum from the plant, together with an undisclosed sum of money. The facility will also create an estimated thirty to forty jobs.[11]

The United States and Britain are accepting hazardous wastes from Canada,[12] and Canada imports hazardous wastes from the United States, which also has a bilateral waste export treaty with Mexico.[13] However, even this legitimate waste trade has confronted serious public opposition. This happened, for example, when a cargo of PCBs from Canada was turned away from British ports last year.[14] Britain especially attracts wastes—importing 80,000 tons a year, primarily from the Netherlands and Belgium—because of its low disposal costs.[15] These costs are five times less than those in France or former West Germany and three times less than those in Belgium.[16] As a consequence, more and more British companies with no previous experience in waste disposal are entering the waste trade.[17]

Even bilateral agreements between exporting and importing countries cannot adequately regulate the waste trade.[18] Illegal waste trafficking often occurs on the United States' borders with Canada[19] and Mexico.[20] Illegal waste exports to Canada are made possible because the written notification and consent of the importing country are not required by the United States–Canada treaty.[21]

The Marshall Islands expect to relieve their economic problems by importing up

to ten percent of the nontoxic wastes produced in the United States. An American waste disposal company hopes to begin transporting wastes soon, and, eventually, to ship tens of millions of tons a year. Kabua, the island that first endorsed the scheme, says that the transaction will be financially advantageous and will provide a needed landfill in the archipelago. Greenpeace, however, accuses the exporting company of trying to avoid American waste disposal regulations. The company, for its part, claims that shipping the wastes to the Pacific nation will be cheaper than transporting them by land to other parts of the United States.[22] In this context, however, it should be noted that the increased volume of hazardous wastes already dumped in the Pacific has rendered the region "the rubbish dump of the world."[23]

As far as radioactive wastes are concerned, Greenpeace reports that Benin agreed to import and dump two shiploads from France.[24] In addition, Sudan and China are willing to import the radioactive waste of former West Germany.[25] The president of Poland's Atomic Energy Agency has admitted that foreign radioactive wastes have been stored at the main Polish nuclear waste dumping site. The president has speculated that the wastes have been shipped illegally by a firm with headquarters in former West Germany and has emphasized that the Polish Atomic Energy Agency issued a regulation in 1988 that banned all imports of radioactive wastes.[26]

To summarize: the problem with waste exports is that they occur secretly, without the knowledge of the receiving country, and often unlawfully when the receiving country has officially denounced waste imports. High-level officials, without the knowledge of their governments, are often willing to participate in these deals because of the profits involved. However, there is fierce public opposition even in cases of lawful waste transportation, as, for example, in the shipping of Canadian waste to Britain described earlier. Often waste transfers from one country to another have been cancelled when the information has become public, even where the government of the receiving country had previously agreed to receive and dispose of the wastes.[27]

Appraisal

Third World countries have fiercely denounced waste importation into their territory. Most of them refused to sign the Basel Convention for the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, claiming that it legitimized hazardous waste transfers instead of prohibiting them.[28] Cameroon has passed a law making it the second country after Nigeria to impose the death penalty for illegal waste trade.[29] At least forty-four countries have banned waste imports,[30] and many have also rejected individual waste transactions.[31]

The Organization of African Unity (OAU) passed a resolution in May 1988, declaring the dumping of nuclear and industrial wastes in Africa to be a crime against the African people.[32] In July 1989, it passed another resolution calling for an African convention to ban the importation of toxic waste into the continent.[33] The final draft of that convention[34] was adopted in May 1990, and submitted to the Pan-African Coordinating Conference on Environment and Sustainable Development held in Bamako, Mali, in December 1990.[35] The Economic Community of West African States has also organized a committee called Dump Watch, whose main duty will be to monitor waste trade and dumping in Africa.[36]

In the beginning, the United States refused to sign the Basel Convention, although it agreed to the terms of the convention in March 1990. Many European Economic Community (EEC) countries advocate a complete ban on waste exports to less industrialized countries.[37] In March 1989, the European Parliament approved a complete ban on hazardous waste exports to developing countries,[38] and a year later the European Community banned toxic and radioactive exports to sixty-eight African, Caribbean, and Pacific countries in accordance with the Lomé IV Treaty signed in Togo in December 1989.[39]

Reality, however, often lags behind brave declarations and laws. Denmark's waste exports to Brazil, on the ill-fated Pro Americana, were approved despite numerous statements of its government that waste should never be sent to developing countries.[40] Similarly, although Nigeria has some of the toughest laws in the world, it is constructing a laboratory to monitor waste imports and to test domestic wastes. The Soviet Union, Japan, and the United States have donated $1.6 million worth of equipment for the laboratory.[41]

Other governments have adopted a more tolerant policy. For example, although Malaysia imports other wastes, it continues to export toxic wastes that it cannot detoxify because it lacks the necessary expertise and facilities.[42] The Republic of Korea imports an "insignificant volume of hazardous wastes only for the purpose of industrial recycling."[43]

Finally, industry has been opposed to discouraging waste trade. The International Environmental Policy Coalition—an industry group comprising some of the United States' largest exporters of hazardous wastes—lobbies against proposed legislation in the United States that would ban the export of solid and hazardous wastes to countries that do not meet EPA standards.[44] Industry has also managed to weaken an EEC directive concerning the liability of hazardous waste transactors.[45]

Premises of a Coherent International Environmental Policy

It is widely recognized that environmental issues are among the most significant problems our global society faces today. Especially after the sweeping changes in Eastern Europe, many believe that environmental threats would constitute the main national security threats of our decade.[46] Budgets previously drained by military defense, environmental advocates maintain, should now be directed toward environmental protection.

Environmental problems are inherently international problems. Ozone depletion, for example, will equally harm countries that do not use chlorofluorocarbons (CFCs). Wastes exported to neighboring countries for landfill disposal may return in the form of contaminated groundwater.[47]

Many problems require international attention, but it is difficult to identify an issue with greater international dimensions than the environment. While the lack of international regulations in most circumstances may simply inhibit the relationships of international actors, the absence of such regulations and agreements often makes environmental problems insoluble. For example, when international trade regulations are difficult to enforce, countries can find refuge in bilateral agreements. In the case of environmental issues, however, bilateral agreements are only temporary remedies unless they are included in the broader framework of an international policy. In the case of ozone depletion, of course, a bilateral or regional agreement would not even make sense. Particularly, in the case of illegal waste dumping, where many countries are potential exporters and importers, a bilateral agreement will be of especially limited value; instead, an international policy is needed.

What are the premises of this international policy? First, international environmental law cannot afford a case-by-case approach to the environmental disputes that often occur between different countries. Such an approach will supply only temporary solutions. Instead, a long-term policy must be developed to prevent further environmental degradation.

Universal declarations, vague guidelines, and principles will not achieve this goal, although they are necessary starting points in shaping an international policy.[48] Later in the process, however, it is essential to clarify the details of the international policy by addressing each individual problem as a unique problem. In other words, each environmental problem has its own implications and should be addressed by a policy that provides for the development of standards as well as implementation and enforcement procedures.

Second, an international environmental policy must take into account the differing perceptions of the developed and developing worlds. The environmental

problems of the developed world are the result of the development process. In the developing world, by contrast, they are the result of underdevelopment: poverty, hunger, lack of water or water of poor quality, high and uncontrolled population growth rates, inadequate housing, slums and shantytowns, proliferation of diseases, drought and desertification. An international environmental policy must allow for the particular problems of underdevelopment and the desire of the developing world for prosperity. In doing so, however, it must ensure that Third World countries in pursuing development will not repeat the mistakes of the First World.

At this point the potential conflict between preventing environmental degradation and encouraging development becomes especially important. The current trend is for development interests to take environmental considerations into account.[49] Although this policy seems correct, it does not supply an answer for every problem. The most important question is how much development the society is now willing to sacrifice in order to protect the environment and the life of future generations. Environmentalists, representatives of industry, and the governments of developed and developing countries all take differing positions on many environmental issues.[50]

Balancing environmental and developmental considerations becomes even more troublesome when one realizes that the dimensions of environmental problems are uncertain. Scientists disagree on the scope of the greenhouse effect,[51] the consequences of acid rain,[52] the dangers of low-let radiation,[53] and the seriousness of the risks posed by hazardous substances.[54] To downplay environmental risks scientists often compare them to the risks associated with natural phenomena, such as background radiation or activities undertaken voluntarily, such as cigarette smoking.[55] These comparisons, however, are not helpful in altering the complex dynamics that mold public opinion. Rational comparisons are many times incapable of convincing a world that is shaped by something deeper than rationality: experienced reality.[56]

Despite the conflicting interests and uncertainty that surround most environmental issues, those who design international environmental policy will have to make decisions that will successfully integrate environmental and developmental considerations.

This means that every developmental plan, on the national or international level, should be assessed for its possible harm to the environment and should be abandoned if inevitable and serious environmental degradation seems likely. If scientists disagree on the possibility and dimensions of these adverse effects, decisionmakers will have to evaluate arguments in light of the worst forecasts. In doubtful cases, the goal of preventing environmental degradation should prevail.[57]

In any event, the decisionmakers will have to be sensitive to the public's experience of environmental problems[58] if their decisions are to be effective.[59]

2

The Current International Regime

The current international regime does not provide the framework for a coherent approach to the transport of hazardous and radioactive wastes nor does it always distinguish between wastes and materials.[1] This section will therefore be divided into two parts, one concerned with hazardous waste transports, and the other with radioactive waste transports.

The Absence of Implementation and Enforcement Procedures for the Transport of Hazardous Wastes

The OECD,[2] the United Nations (U.N.),[3] the UNEP,[4] and the EEC[5] have tried to address the problem of transnational waste movement with recommendations, resolutions, guidelines, and directives. With the exception of the EEC directives, however, these decisions are not binding, and in most cases, the member states have been reluctant to abide by them.

The two documents that deal most extensively with the problem of hazardous wastes are the Basel Convention[6] and the Bamako Convention.[7]

One of the principal deficiencies of the Basel Convention is that it does not define "waste," and the national laws to which this task is left define the term in different ways. Not all of these definitions include wastes destined for recycling.[8] The specific definition of *hazardous* waste is also problematic: wastes are designated as hazardous only if they are included in the categories contained in Annexes I, II, and III of the Basel Convention. These annexes classify wastes according to their method of production, their hazardous constituents, and their hazardous characteristics.[9] This type

of definition is similar to the one used by the EEC[10] and many individual countries.[11] In other words, the Basel Convention's definition suffers from all of the deficiencies of previous definitions: inadequate categories of hazardous waste, their characteristics, and their constituents. The convention has not confronted the challenge of comprehensively defining hazardous wastes by providing for the integration of existing national and regional definitions. It has failed to establish also a procedure for updating its lists of hazardous waste constituents and characteristics to accord with current scientific findings.[12] Finally, it does not include the methods of sound waste management in its definition of hazardous wastes.

The regime prescribed in the Basel Convention requires written consent of importing countries before hazardous wastes may be shipped.[13] In addition, exporting countries should prohibit such shipments if they believe that the wastes will not be managed in an environmentally sound manner,[14] although environmentally sound management is not defined. The convention does later mandate that states "take the appropriate measures to ensure" that waste exports will be allowed only when the exporting countries do not have the technical capacity to deal with their hazardous wastes or when the wastes are to be exported for recycling.[15] Appropriate measures, however, are also not defined. The convention additionally imposes upon exporting states the duty to reimport their wastes, even when the importing states have consented to dispose of them if disposal cannot be completed in accordance with the contract terms.[16]

As far as illegal traffic in hazardous waste is concerned, the Basel Convention dictates that the perpetrators' states of origin must ensure that the wastes are disposed in an environmentally sound manner.[17] The convention does not, however, address the prevention and punishment of illegal traffic,[18] nor does it prescribe rules for liability and compensation.[19] Finally, it permits states to impose their own conditions for waste transport through bilateral or regional agreements.[20]

The Bamako Convention views the waste transport into Africa from non-party nations as an illegal and criminal act.[21] This is an absolute rule with no exceptions. In addition, its definition of hazardous wastes is significantly more expansive than that of the Basel Convention. Included are radioactive wastes, wastes derived from the normal operation of ships, and hazardous substances "that have been cancelled or refused registration by government regulatory action" or have been "voluntarily withdrawn from registration in the country of manufacture for human health or environmental reasons."[22] The convention also requires the parties to prohibit the dumping of hazardous wastes at sea and in internal waters.[23]

The provisions concerning waste generation in Africa are also significant. States

that are parties to the convention undertake to impose strict, unlimited, joint, and several liability on domestic hazardous waste generators[24] and to ensure that such generators report the nature of their wastes to the secretariat established by the convention.[25] These reports are intended to provide information for a complete hazardous waste audit.[26]

The convention also encourages states to adopt the so-called precautionary principle[27] and promote clean production methods applicable to the entire life-cycle of products.[28] Such methods do not include incineration and any other methods that transfer pollutants from one environmental medium to another.

The provisions of the convention that deal with the duty of exporting states to reimport,[29] and with illegal traffic[30] are similar to those of the Basel Convention. Under the Bamako Convention, however, illegal waste traffic becomes a crime,[31] and the parties undertake to impose penalties to punish and deter it.[32] On the other hand, the convention does not provide for liability and compensation in the transnational movement of wastes[33] or for a regional enforcement mechanism.[34] Instead, enforcement is left to national legislatures.

Thus, apart from its significantly expanded definition of hazardous wastes, the Bamako Convention does not advance the goals of transnational management. Specifically, its absolute ban on waste imports from non-party countries subverts the possibility of developing such imports accompanied by appropriate technology for waste treatment, a mechanism that would enable countries to acquire the know-how they need to treat their own wastes.

In my opinion, the evidence demonstrates that the emerging norm of the international regime governing the transport of hazardous wastes is prior notification and consent of importing countries. On the other hand, only prior notification is required for the transport of hazardous products.[35] Many international commentators claim that this is the reason why states refuse to include dangerous products and wastes in a single export regime.[36]

The legislation of individual countries governing transnational waste transport is also insufficient. While most OECD countries have adopted legislation on hazardous waste management[37] and transport,[38] it generally shares an essential defect: the prior notification and consent of the importing country is not a prerequisite for waste exports. The United States and the Netherlands make such prior informed consent an element of the transportation process. After the waste-dumping scandal in Nigeria, Italy enacted a law requiring "documentation ... which proves the approval of the importing country and the existence of adequate disposal facilities."[39] However, even the existing national legislation is rarely implemented, because it is difficult for states to

enforce these laws[40] and to trace the processes of waste generation and disposal.[41]

To summarize: the current regime governing hazardous waste exports is inadequate. It does not provide a coherent definition of hazardous wastes or procedures for implementation and enforcement. It does not address the issues of illegal waste trafficking or liability and compensation. For these reasons, only fifty-four states have signed the Basel Convention and three have ratified it.[42] The only African state that has signed the convention is Nigeria.[43]

It remains to be seen how many countries will sign the Bamako Convention and whether it will have an impact on the attitudes of developed and developing countries. It is doubtful, however, whether a regional convention will resolve the problem when the laws of most developed exporting countries do not even require prior informed consent and existing international legislation contains no enforcement procedures.

The Incomplete Regime for the Transnational Movement of Radioactive Wastes

In 1990, the International Atomic Energy Agency (IAEA) enacted the Code of Practice on International Transboundary Movement of Radioactive Waste. These guidelines are similar to the provisions of the Basel Convention.[44] According to the guidelines, radioactive wastes should be moved in accordance with international safety standards and only when all transit countries and the receiving country have consented.[45]

Before the 1990 guidelines, there were no international regulations concerning radioactive waste exports. The IAEA had, however, enacted guidelines addressing the export of nuclear materials and specifying design and performance tests for packing radioactive materials.[46] These guidelines impose administrative controls and require transport documentation. However,. the prior consent of the importing countries is not needed.[47]

In short, the IAEA regime is similar to the existing regime for the transport of hazardous wastes and products: it distinguishes between wastes and materials, requiring notification for the transport of materials and additional prior informed consent only for the transport of wastes.

The transport of radioactive wastes has also concerned the United Nations. A 1988 resolution directed the Secretary General to prepare a report on dumping in Africa that would address progress in monitoring, controlling, and ending the practice.[48] At the same time, the U.N. also requested that the Conference on Disarmament "continue to take into account ... the deliberate employment of nuclear wastes to cause

destruction, damage, injury by means of radiation produced by the decay of such materials."[49]

As far as individual countries are concerned, most countries that produce nuclear power have adopted laws controlling the management of radioactive wastes.[50] They have not, however, enacted legislation to deal with the cross-border movement of such radioactive wastes.[51]

Existing conventions on liability in case of nuclear accident are not especially helpful in the case of accidents involving radioactive wastes.[52] More specifically, the Paris and Supplementary Brussels Conventions use the broad "radioactive products and waste." Although they expressly include the storage of nuclear substances among the activities subject to liability, they do not mention radioactive waste disposal. In addition, although they provide for limited and strict liability in cases of nuclear accident, they impose a ten-year deadline for the submission of claims, a limitation that is inappropriate for nuclear waste accidents because their severe and far-reaching effects may not manifest themselves for longer periods.[53]

Another inadequacy of the current regime is that it does not provide a coherent definition of radioactive wastes. The IAEA divides waste into five categories.[54] In practice, however, waste management decisions are based upon case-by-case considerations concerned largely with the form of the waste, its specific activity, its origin, its packaging, and a safety analysis of the particular disposal facility. Classes of waste, therefore, differ widely from one country to another and among different installations within the same country.[55]

3

Model International Policy

According to the premises set forth in Chapter 1, the international policy for transnational waste movements should be coherent and detailed, should not permit further environmental degradation, and should take into consideration the particular needs of developing countries. How should this policy be translated into specific standards and requirements?

First, waste exports must be distinguished from the export of products or dangerous goods and substances. Second, radioactive wastes should be included in the regime governing hazardous wastes. Third, the notion of environmental degradation, and its prevention, must be defined in the context of transnational waste movement: here, differing levels of development between exporting and importing countries become relevant.

Wastes and Products: Distinct Rules for Different Needs

The UNEP, OECD, and EEC treat waste exports differently from the export of dangerous products.[1] International commentators, however, have criticized this approach, asserting that differentiation between waste exports and exports of products prevents the application of prior informed consent in the latter case.[2]

An environmental policy that will resolve specific environmental problems must include special international rules for waste transport. This does not mean that the principle of prior informed consent should not generally apply to the transnational movement of products or substances; to the contrary, this is a procedural rule that

should ideally apply to all dangerous goods. Waste exports do, however, present particularities that necessitate separate treatment.

First, there is a qualitative difference between wastes and products. Non-recyclable wastes are materials with no further use, and exporting industries try to get rid of them in the cheapest way possible, while the citizens of importing countries insist that their territories should not become the dumping ground for other countries' wastes. On the other hand, products deemed dangerous by the standards of exporting countries, could be considered suitable for the needs of importing countries.[3]

Second, wastes will continue to be generated in smaller or larger amounts as long as industrialization remains society's model for development. In contrast, dangerous products can be banned as soon as their dangerous properties are known and the political will exists. In other words, hazardous wastes are the inevitable outcome of the methods of industrial production, while the manufacture of dangerous products can easily be stopped, especially if they are produced solely for export to the Third World.[4]

Third, while technology transfers are not indispensable to the export of products, they are essential to waste exports. In other words, waste management considerations should be incorporated into the policy governing waste transport, and no waste export should be permitted unless it is accompanied by the appropriate technology. Traces of this policy orientation exist in the Basel Convention, which provides that states should not permit hazardous waste exports unless the importing states have the facilities to deal with the wastes in an environmentally sound manner, while the exporting states do not, or the wastes are being exported for the purposes of recycling and recovery.

However, even these prescriptions oversimplify the considerations that should be taken into account, because they are based on the principle that the countries that generate wastes should be primarily responsible for them. This principle conflicts with the principle that considerations of sound waste management should control, regardless of which countries generate the wastes. For example, if two countries have waste processing facilities, but those of the importing country are more effective, and perhaps even less expensive, it would be counter-efficient to apply the principle that the generating country should be responsible for the wastes. In other words, the identification of appropriate disposal sites should be unconnected to the "nationality" of wastes. More crucial considerations should prevail: the distance between the place of generation and the place of disposal, the likelihood of accidents en route, and the availability and quality of waste management facilities at the place of disposal. Concerns about the country of origin of waste should be irrelevant.

The Imperative for a Single Waste Transport Regime

There is at present no serious challenge to the prevailing view that radioactive wastes should be subject to different rules from those governing hazardous wastes.[5] Most commentators agree with the traditional separation between hazardous and radioactive waste transfers.[6] This distinction, however, unnecessarily fragments the regime of waste transport. In fact, identical rules could benefit transnational waste management.

The rules that govern hazardous waste exports, such as the requirement of prior notification and consultation, are procedural rules whose application will not be affected by the technicalities related to waste management. Procedural rules are not affected by the technical details of waste management and transportation, rather, such details simply modify the content of the information provided in individual circumstances. This is demonstrated by the fact that, in 1990, the IAEA finally adopted for radioactive waste transport the rule of prior informed consent, which had previously applied only to the transport of hazardous wastes.

Furthermore, there is no scientific basis for strictly distinguishing between hazardous and radioactive substances. To the contrary, hazardous and radioactive wastes have many elements in common. Radioactive wastes often present toxic characteristics that can be as harmful as their radioactive characteristics.[7] In addition, low-level radioactive wastes are often mixed with other hazardous wastes.[8] In fact, many times, naturally-occurred radiation is mixed with dangerous materials such as oil.[9] Finally, hazardous waste management can benefit from scientific innovations in the field of radioactive waste management.[10] These considerations support the value of a single regime for waste exports.

Despite the potentially substantial similarities in their management, however, it has been argued that nuclear and hazardous waste transports should be subjected to different rules for two reasons: first, unprocessed nuclear wastes can be used to make nuclear weapons;[11] second, nuclear wastes are vulnerable to theft and sabotage. These are legitimate worries.

It must be realized, however, that importing wastes is not the only method of obtaining material for nuclear weapons. Nations that can produce nuclear energy can easily manufacture nuclear weapons, and several nations that produce nuclear power have not signed the Nuclear Non-Proliferation Treaty.[12] Besides, the transportation of any kind of nuclear material is vulnerable to terrorist attack and theft. The crucial question is therefore not whether nuclear waste transport should be prohibited or subject to different rules, but rather whether international safeguards can be developed that will specify how wastes are to be safely transported, where they are to be taken, and how they are to be treated.

Waste Exports that Assist in Preventing Environmental Degradation

Three elements characterize policies that will successfully prevent environmental degradation in the case of waste exports. First, such exports should not undermine the goals of sound hazardous and radioactive waste management.[13] Ideally, in fact, they should enhance these goals. For this reason, the effectiveness of waste treatment facilities must be compared in the exporting and importing countries.

Second, waste exports from one region to another should be preceded by an analysis of the accidents that might occur en route and of importing country's waste management facilities. In other words, the distance between the exporting and receiving countries, the suitability of shipping roads, and the performance of available transport equipment should be considered. In addition, the effectiveness of waste management in the receiving country should be examined.

Third, if environmental degradation is to be prevented, waste exports must be inspected. It is better to allow waste shipments and observe them, than to prohibit them and encourage illegal waste trafficking.[14] Transports will continue as long as industries have incentives to export wastes and receiving countries have incentives to accept them. The waste trade cannot be stopped when the sums involved exceed the gross national product of the receiving country and industries save significant amounts of money: even if it were outlawed, the trade would certainly continue, but this time without controls.[15]

The likelihood of this outcome is demonstrated by the fact that prohibitions in the area of international trade are generally not effective. For example, because prohibition has been fueling illegal trade, some countries have decided to legalize drug use.[16] Similarly, in the case of the ivory trade, some countries have opposed the ban on ivory sales, maintaining that the profits provide an incentive for the native population to preserve the elephant herds.[17]

If environmental degradation is to be prevented, it is essential to identify the considerations that should be taken into account, but also to understand how these considerations function in the case of transnational waste movement among developed, and between developed and developing countries.

A Cost-Benefit Analysis of Waste Trade Among Developed Countries. In deciding whether a waste shipment should be permitted, decisionmakers should take the following factors into account:

- The number and quality of disposal facilities in the importing country. Are these facilities better or worse equipped to process the wastes than the facilities of the exporting country?

- The distance between the exporting and importing countries. Is the importing country's disposal facility closer to the waste generator than the exporting country's facility? Is transport to this facility safer because of a better transportation network?
- The performance of the industry that undertakes waste transport. Do the trucks, ships, or airplanes conform to current international standards for the transport of dangerous goods?
- The frequency of accidents during the carriage of hazardous and radioactive substances.

These are the factors that should ideally be considered for safe and efficient transnational waste management. The problem, however, is that most of these questions have no clear-cut answers. This is so because there is no international agency that could undertake the necessary comparisons and insufficient data on the frequency of accidents so that the efficacy of international rules cannot be evaluated.

According to the International Maritime Organization (IMO), a basic flaw of the current reporting system is that it is voluntary.[18] In addition, accidents involving hazardous substances are insufficiently reported,[19] and the same insufficiency is feared in the case of radioactive wastes.[20] The fear is justified. Many national authorities have proven incapable of tracing the movement of hazardous and radioactive wastes within their borders.[21] Furthermore, because hazardous and radioactive wastes have no further use and are very expensive to dispose of, exporters have an additional reason to be negligent and "lose" the wastes at sea.

The lack of data makes accurate estimates of future accidents difficult. It should be noted, however, that waste transport is generally not a safe enterprise.[22] For this reason, especially careful attention should be given to those cases in which the possibility of transport accidents must be balanced against better waste treatment facilities in the importing country. Under those circumstances, it would be better for the exporting country to develop its own facilities, although the outcome will obviously depend upon the technological improvements achieved in the particular mode of transportation involved and on the exporting country's ability to develop its own facilities with sufficient rapidity.

The balance is different when facilities of the importing country are closer to the waste generator than those of the exporting country. In this instance, waste transport should generally be allowed, especially if the importing country has particularly efficient facilities for waste treatment.[23]

These various considerations demonstrate the need for a complex analysis in waste

transport decisionmaking. Unfortunately, however, the lack of sufficient data and of an international monitoring agency renders this analysis difficult.

Waste Trade and the Particular Needs of Developing Countries. Additional considerations should be included in the case of waste exports to Third World countries that typically lack expertise in dealing with the problems of industrialization and have other problems resulting from underdevelopment. In view of these disadvantages, it is obvious why Third World governments have been outraged by the companies of the industrialized world that have dumped wastes in their territories without their approval.

It is possible, however, to conceive of waste exports to Third World countries in a totally different fashion. Most of these countries wish to develop and to participate in the process of industrialization, and waste technology transfers could help them learn to deal with their own hazardous and radioactive waste streams. In order to explore this possibility, it is essential to distinguish among developing countries according to their levels of development. The more developed a country is, the more hazardous wastes it will generate, and the more it will need technology transfers from the developed world. In other words, the benefits from the waste transport to be enjoyed by developing countries depend, to a large degree, on their infrastructure and policy orientation concerning matters of development.[24]

For the above reasons, landfill disposal should ideally be excluded as a waste management method in the Third World:[25] developing countries should not repeat the mistakes of the First World. Indeed, the particular circumstances of the Third World render such exclusion even more imperative. For example, although water quality is generally poor,[26] drinking water is often not treated before final consumption.

In addition, radioactive waste exports should be discouraged when the importing country does not produce nuclear energy, and consequently, lacks the necessary infrastructure and know-how. Things are different when the country is already involved in nuclear energy production. In this case, both exporting and importing countries could benefit from nuclear technology transfers. In any event, it is important to strengthen and implement existing safeguards for non-military use of nuclear power, and to develop additional guidelines for safe transport and disposal.

Incineration is also not a desirable method for waste treatment in the Third World, especially in the relatively less-industrialized developing countries, for example, many African countries. Incineration plants are highly sophisticated and require significant technological expertise.[27] In addition, capital costs involved are very high, especially in the case of hazardous waste incineration, which requires scrubbing equipment.[28]

Third World governments are often accused of engaging in futile megaprojects instead of dealing with real needs, and building an incineration plant for the exclusive treatment of imported wastes would repeat this mistake. In addition, the political uncertainty of the Third World, where many regimes are constantly threatened by revolts, revolutions, and civil wars, prevents the completion of many ambitious projects.

In contrast to landfill disposal and incineration, recycling is a promising enterprise.[29] For example, some developing countries have developed innovative methods that permit them either to export recycled products to developed countries[30] or use them domestically,[31] and Third World industries have discovered ways to diminish their production costs by using their own waste materials. For this reason, waste supplies are relatively expensive in many Third World countries,[32] although the recycling industry also helps them to cope with high unemployment rates.[33]

While these are clearly the primary factors that should be taken into account when wastes are exported to developing countries, the practices of transnational waste movement largely ignore them. Industries often conceal the amount of waste they generate and engage in illegal trafficking by falsifying documents and officially reporting sounder methods of waste disposal than the ones they actually use.[34] In other words, industries engage in waste trade not because it is the most efficient way to manage wastes, but because it is the cheapest way to dispose of them. Thus they increase their profits. And while increasing profits is not by itself reprehensible, it should be roundly condemned when it undermines the goals of efficient waste management, and thus contributes to environmental degradation.

For these reasons, landfill disposal and incineration, while they should be discouraged, they must not be prohibited. It is better to permit agreements involving waste trade for landfill disposal and to monitor them, than to be confronted with the consequences of an extensive illegal waste trade. International rules should be prescribed even for sanitary landfill disposal and incineration. As was emphasized at the beginning of this section, the prevention of environmental degradation entails that the waste trade be observed and regulated, rather than prohibited. Landfill disposal and incineration should be included among the acceptable methods of international waste management, subject to stringent rules of liability, compensation, state responsibility, and punishment of illegal waste disposal. These rules will function as disincentives for the waste transport to Third World.

4

The Transnational Management of Hazardous and Radioactive Wastes

Including Technology Standards in the Definition of Waste

The most significant deficiency of existing waste definitions is that they do not include methods of sound waste management. The description of every waste, however, should be accompanied by an analysis of the best available technology for its treatment. This step will overcome the deficiencies of current descriptive definitions[1] by incorporating internationally designated standards for transnational waste management. That is, waste definitions must be more than explanatory of the terms *wastes, hazardous,* and *radioactive*. We need a definition-instrument for the monitoring of transnational waste management.[2]

Including the best available technology in the waste definition would facilitate the work of an agency established to regulate the movement of wastes[3] by making the information readily obtainable, and thus permitting prompt comparisons with the actual methods proposed.

Another question to be addressed in the definition of wastes is whether materials destined for recycling or reprocessing should be included. In the case of hazardous wastes, countries have diverging definitions, not all of which include recyclable materials.[4]

The better approach is to treat recyclable materials as wastes so long as there is no market for the recycled products into which they could be made. There are instances in which such materials could be recycled, but are not because of lack of demand. While these materials are logically defined as wastes, however, it is also essential to

create economic incentives so that businesses will use recycled products, recycle their wastes, and invent new recycling methods.[5] Similar considerations apply to the definition of radioactive wastes. Materials that could be reprocessed should be considered wastes so long as there is no market for them. However, because reprocessing is particularly expensive, most countries do not engage in it,[6] and others send their wastes abroad to be stored for later reprocessing.[7] So long as reprocessing remains prohibitively expensive, it is important to classify as wastes both materials stored for final disposal and those stored for reprocessing, but are not actually reprocessed.

Finally, a systematic updating of lists of hazardous wastes, and their constituents and characteristics, is necessary. An adequate updating process would require an international computerized system linked with analogous national systems staffed by experienced personnel capable of handling and evaluating the information received.

Establishing an International Monitor for Transnational Waste Management

The dimensions of the waste trade, and particularly of the illegal waste trade, can effectively be addressed by an international agency to monitor the trade. One of the principal duties of this agency would be to inspect and compare the disposal facilities of importing and exporting countries, rather than simply accepting those countries' reports on the availability and efficiency of their own facilities. It must, that is, be actively involved in transnational waste management.

Because most importing and exporting countries have a significant number of facilities,[8] the agency may find it difficult to inspect them and, even more importantly, to monitor their current compliance.[9] The agency must therefore be organized geographically. For example, regional agency delegations should be created in each continent, and the agency also should have representation in individual countries. These delegations, in coordination with domestic environmental ministries, should conduct unannounced inspections of waste treatment facilities.[10]

In its capacity as international inspector, the agency should also monitor waste shipments and require documentation with each shipment, including the applicable waste definition.[11] The inclusion of both the applicable waste definition and the actual methods of waste management should help the agency verify the extent to which waste management prescriptions are implemented in practice, and the results of these studies should be periodically published and made available to the public.

The agency would also be responsible for detecting accidents that occur during waste transport and disposal and for taking appropriate remedial action. An "international police force" could be created under the agency auspices, both to discover the

accidents and to report on their causes and severity. The agency would then publish an annual report summarizing the frequency and causes of accidents and recommend changes in international rules and practices to prevent future accidents. At the same time, the agency should establish a fund for immediate remedial measures after accidents have occurred. Relief should be made available for both injury to people and harm to the environment.[12]

As earlier noted, an important part of the agency's work would be to publish extensive reports on transnational waste management, focusing specifically on waste disposal practices and transport accidents. These extensive reporting functions could create some misgivings that the agency will become another international bureaucracy. It should be remembered, however, that reporting is only one of the agency's proposed functions. The other is extensive monitoring, an activity that will directly prevent illegal waste trafficking. In addition, reports that are made available to the public can spur public condemnation of unsound waste practices, making it less likely that image-conscious industries will engage in environmentally damaging activities. Public opposition to illegal practices would significantly increase disposal costs. Finally, agency bureaucratization can be avoided through its personnel structure, which should emphasize expertise, but also include representatives from citizen groups and the waste industry, as both of these constituencies keep abreast of technological developments in the field.

Finally, in addition to performing these primary functions, the agency can also promote sound waste management in developing countries by rewarding those countries that implement appropriate methods.[13] Direct financial aid or low-interest loans could provide incentives for model environmental behavior. More broadly, the agency might develop a concept of "exemplary environmental behavior." This standard could be incorporated also as a principle or supplementary condition in financial aid agreements with Third World countries.[14]

Questions of Liability and Compensation in Transnational Waste Management

Before prescribing a waste specific regime for liability and compensation, it is essential to analyze the current international private liability regimes. In fact, such systems generally present a challenge for international law because they make indispensable transnational enforcement procedures and remedies.

The Current International Private Liability Regimes. These regimes comprise strict and limited liability. Strict liability is preferred because proving fault is costly, and

because the person engaged in dangerous activities is the best cost-avoider.[15] Limited liability is preferred because it embodies a compromise between the dangerousness and the social desirability of an activity. Especially in the case of hazardous activities that are both dangerous, and socially desirable, the decisionmakers must undertake a cost-benefit analysis when choosing liability rules.[16] In the following paragraphs the current liability regimes will be analyzed.

The 1962 Convention on Liability of Operators of Nuclear Ships[17] imposes strict and limited liability upon the operators of nuclear ships who are absolutely liable for any damage caused by the nuclear fuel, radioactive products, or wastes of their ships.[18] The liability, however, is limited to a specified sum.[19] Operators are also required to maintain insurance or other financial security sufficient to cover this potential liability. The amount, type, and terms of the required insurance are to be specified by each state, but in cases where the prescribed coverage is less than the limited liability cap, the state must make up the difference if an accident involving that sum occurs.

Another convention providing for strict and limited liability is the Convention on Civil Liability for Oil Pollution Damage,[20] which holds shipowners strictly liable for pollution damage resulting from oil spills that occur in the territories of contracting states. Shipowners may limit their liability, provided that the spills do not result from their actual fault or privity, by constituting a fund equal to the liability limit prescribed by the convention,[21] either through insurance or otherwise. This regime is supplemented by the 1971 International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, which makes compensation available, to the extent that the compensation under the 1969 Convention is inadequate,[22] from a fund created by contributions collected from entities that receive oil transported by sea.

The Paris Convention on Third Party Liability in the Field of Nuclear Energy[23] and the Vienna Convention on Civil Liability for Nuclear Damage[24] similarly impose strict and limited liability upon nuclear power plant operators. These conventions include clauses on the carriage of nuclear substances, although not specifically on wastes.[25] The prescribed liability is imposed on either the operator who sends the substances or the operator who receives the substances. Many countries that produce nuclear energy have not signed these treaties.[26] However, most of them have opted in their national legislation for strict and limited liability in the field of nuclear energy.[27] Moreover, some states have opted for unlimited nuclear liability.[28]

The Paris Convention is supplemented by the Brussels Convention,[29] which pre-

scribes a compensation method for damages caused by an incident at a nuclear installation whose operator is liable under the Paris Convention. A portion is provided by the operator's insurance, another portion by the installation state, and the balance by contracting states according to special formula based upon the gross national product, and the nuclear power of the installation state in relationship to those of all member states.[30]

It should be noted that industry generally favors strict and limited liability. Indeed, 701 oil companies participate in CRISTAL,[31] whose purpose is to supplement the 1971 Convention for Oil Pollution Damage.

Although strict and limited liability clearly prevails in international law, the next section will demonstrate that it is inadequate for the transnational waste management. Instead, strict and unlimited liability should be prescribed, and private liability should also be supplemented by state responsibility.

The Need for Innovative Institutions. In the case of waste generators, liability should be strict in form and unlimited in amount, with compensation levels determined by an international tribunal on a case-by-case basis. Such unlimited liability for waste generators is desirable because it is more compatible with the prevailing concept that " the polluter should pay."[32] This principle expresses the perceived moral character of many environmental issues: ethical considerations are pervasive in the environmental movement and consequently influence the shape of environmental law.[33] In this climate, limited liability looks more like a financial settlement and a compromise of interests that will probably leave the parties unsatisfied, and therefore perpetuate disputes.[34] Unlimited liability, in contrast, retains at least the appearance of respect for victim's rights and may evolve into a regime genuinely respectful of those rights if it is supplemented with other mechanisms, for example, a fund providing immediate relief.

The problem with unlimited liability, however, is that it would require an elaborate, expensive, and time-consuming adjudicatory system. It is difficult to envision a time-efficient adjudicatory system,[35] particularly, for environmental disputes involving complex and often emotionally charged issues. For this reason, a separate international environmental court would be necessary, available for both states and individuals. Despite its possible case overload, the court would function as a tension release mechanism, so that victims would no longer feel the helplessness that arises when one confronts prearranged outcomes like limited liability.

Because of possible delays, however, a fund would also be needed from which money could be immediately distributed to individual victims and for repair of larger

environmental harms. The size of the fund would be periodically reviewed and tied to a standard currency. The fund could be replenished through several sources. For example, states engaged in extensive waste imports and exports could contribute, although the relative wealth of each individual country would also have to be taken into account. In addition, national governments could impose taxes on waste generators and waste transporters, although the latter would probably pass their taxes on to the generators. Taxation, however, might not be the best solution. A sensitive balance would be required between the taxation level necessary for the fund to operate and the level at which industries would be tempted to engage in false reporting of their wastes in order to avoid excessive taxation. For this reason, an additional fund source could be fines imposed on illegal waste traffickers.

State Responsibility and International Liability: A Successful Distinction?

An Outline of the Theoretical Discussion. The international body concerned with the clarification of the concepts of state responsibility and international liability is the International Law Commission (I.L.C.). It is a group of experts established by the U.N. General Assembly in 1949 concerned with the codification and development of international law. The Commission has not yet concluded its work on state responsibility. The development of the notion of international liability is at a preliminary stage. The Commission appointed Rapporteur Quentin-Baxter from 1980 to 1984 who submitted five reports before his death. Rapporteur Julio Barboza has continued the work of Quentin-Baxter since then.[36]

The rapporteurs distinguish between state responsibility and international liability. State responsibility applies to wrongful acts, while international liability applies to lawful acts of states that nevertheless result in injury. This seemingly clear-cut theoretical distinction, however, entails many ambiguities in its interpretation.

More specifically, a wrongful act is a violation of a primary international rule. As a consequence of its violation, the responsible state must cease its actions and make reparations to the injured state, although the latter may terminate or suspend the performance of its obligations to the injuring state, whether or not they are related to the matter in dispute.[37]

In the case of international liability, however, the payment of damages is incorporated in the primary obligation[38] to prevent, inform,[39] negotiate, and repair. In other words, international liability includes not only the obligation of reparation, but a range of other duties as well, although it is not clear whether these duties involve a

right to action.[40] When actual reparations must be calculated in a case of international liability, Rapporteurs Quetin-Baxter and Barboza maintain that the interests and shared expectations of the parties should be balanced.[41] It should be noted that both rapporteurs are hostile to the idea of strict liability in the context of international liability.[42] Professor Handl, however, prefers it,[43] although he admits that, even if the concept of shared expectations is vague, its specific formulation is close to the concept of strict liability.[44]

The distinction between state responsibility and international liability has generated significant controversy. One of the principal objections has concerned language: while the words *liability* and *responsibility* both exist in English, the same is not true for French and Spanish, where one word, *responsibility,* is used for both concepts.[45] The unavailability of words in other languages to describe international liability and state responsibility can lead to significant confusion in the translation of documents and, more importantly, in the subsequent deployment of each concept in interstate negotiations and court decisions. It seems likely that this lack of linguistic equivalence will eventually mean that the term *state responsibility,* will include the duties entailed in international liability and vice-versa.

Another shortcoming of the term *international liability* is that it is used in a fashion otherwise foreign to international legal culture and experience incorporating only primary obligations, and not their breach.[46] Essentially, the notion broadly includes what seems to be emerging as customary international law in the area of environmental protection: the obligation to prevent, inform, and negotiate in light of the parties' balance of interests. It is questionable whether the term *liability* can adequately describe such a regime.

Another basic argument raised by those who oppose international liability is that "it is the content of the relevant rules of the particular case which is critical [in most cases] and a global distinction between lawful and unlawful activities is useless."[47] In other words, this view holds that it is the context in which an activity takes place that determines its lawfulness or wrongfulness. To this objection proponents of international liability respond that the distinction between wrongful and not-unlawful activities should be maintained because of the stigma attached to the former.[48] According to this position, states will be less reluctant to comply with a rule designating their activities as lawful, if unfortunate in their consequences, rather than as wrongful. However, emphasizing the need for this distinction does not answer the argument that it should be made on a case-by-case basis. In fact, even Rapporteur

Barboza admits that only by taking relevant circumstances into account can decision-makers distinguish between lawful and unlawful activities.[49]

In general, proponents of international liability argue that it essentially the expression of an international tort system applied at the state level.[50] States are liable for the activities that occur in their territories if these activities are dangerous and cause "appreciable injury" in another state.[51] The concept also seems to apply both to accidental harms,[52] and to continuously harmful activities not yet prohibited by a primary rule of international law.[53] Finally, the payment of damages is based not on the violation of a rule of law, but on a balance of interests.[54]

This perception of international liability as equivalent to an international tort system is helpful, but additional considerations must also be taken into account. The distinction between lawful and wrongful activities is not as clear in international law as in domestic law, because international rules are less specific than municipal rules, often embodying a compromise of conflicting interests among multiple state actors. And in order to conceal this conflict of interests and the inevitable balancing that takes place,[55] the International Court of Justice (ICJ) systematically avoids discussing issues in fashion that would reveal this conflict.[56] Instead, it engages in a rhetorical discourse that offers the appearance of conflict resolution, using legalistic arguments to cover political questions.[57]

However, precisely because of the legalistic discourse before the ICJ, the concept of international liability may become a useful addition to a plaintiff state's arsenal. In a case of state responsibility, the injured state must prove that the state activity in question was *wrongful*, because it violated principles of international law or an international treaty. In a case of international liability, however, the plaintiff state need not prove wrongfulness. Instead, it has only to demonstrate that the activity had *damaging effects*. Although its case will instead focus on damaging effects, however, the argument will entail a similar discussion in the end. This is so because both wrongfulness[58] and damaging effects claims are inevitably subject to the balance of interests of the parties.

Within this framework, international liability is simply another tool states can use to support their claims in transnational fora, and it could be useful for that purpose so long as state responsibility remains linked to wrongful activity. As a theoretical matter, however, the concept itself,[59] and its relationship with state responsibility, should be further clarified.[60]

Finally, it would be more practical to broaden the concept of state responsibility so that a state's act would be explicitly included if it had damaging effects in the territory

of another state, even if lawful. The continued use of different terms one of which does not have an equivalent in other legal systems would create confusion and increased uncertainty rather than facilitating the process of dispute resolution. The following section includes some preliminary thoughts on the issue of state responsibility and international liability in the transnational management of hazardous and radioactive wastes. The terms international liability and state responsibility will be used interchangeably.

Implementation in the Case of Transnational Waste Movements. The prevailing international norm is that exporting states are not responsible when hazardous substances damage the environment of importing states. International liability does not exist in the case of dangerous exports,[61] because the act of export does not physically originate in the exporting state, as it is the case with air pollution,[62] and the importing state can control the substances that enter its territory. This is true in theory, but not in practice. In practice, states cannot effectively control the substances that enter their territories: one must consider the staggering dimensions of existing illegality in many domains of international trade. In addition, since both wastes and the facilities for their treatment will be with us for thousands of years, someone must take responsibility so that these substances cannot harm future generations, long after the waste generator and the transporter have ceased to exist.[63] For both of these reasons, state responsibility is imperative in the transnational waste management. This does not mean, however, that it should replace parties' liability. Instead, state accountability should be residually supplementing rather than replacing private liability.

State responsibility claims should be available under the following circumstances: when the exporting state has failed to notify the importing state of an imminent hazardous transport or has permitted the export to proceed without the consent of the importing state and when the exporting state has failed to notify the exporter that the importing state has refused the waste. State responsibility, under these circumstances, is appropriate because notification and prior informed consent are emerging principles in the area of transnational waste transfers. Ultimately, principles of international liability must also be developed to cover three additional situations: first, when illegal waste trafficking has occurred; second, when the generator and the transporter cannot pay the necessary sums for compensation and restoration of the environment; and third, when a cause of action is brought and both the generator and the transporter no longer exist.

Conclusion

In order to advance, international environmental law needs both standards and implementation and enforcement procedures. This monograph has proposed such standards and procedures for hazardous and radioactive wastes by specifying a framework and the essential elements of a transnational waste management regime.

Notes

Notes to Introduction

1 The figures in this monograph could vary depending upon how inclusive a definition of hazardous wastes one uses. For an extensive discussion of this issue, *see infra* Chapter 4. In this paper the terms "hazardous" and "toxic" wastes are used interchangeably.

2 Tifft, *Who Gets the Garbage?*, TIME, July 4, 1988, at 52.

3 Shabecoff, *Irate and Afraid Poor Nations Fight Efforts to Use Them as Toxic Dumps,* N.Y. Times, July 5, 1988, at C4, col 4 ("[i]n 1984, Congress effectively barred the disposal of most toxic materials in landfills. It can now cost as much as $2,500 a ton to get rid of toxic wastes as prescribed by law, although in most cases the cost is somewhat less."). *See also United Kingdom: Industrial Waste Disposal Costs To Soar, British Industry Group Says,* 13 INT'L ENV'T REP. (BNA) 211 (1990) ("Dr. Ted Thairs, Head of the Confederation of British Industry's Environment, Health, and Safety Group, said that research by his organization showed that industry spends at least £3 billion ($4.9 billion) annually on waste disposal, and that the cost could more than double, to about £7 billion ($11.5 billion), by the end of 1992.").

4 MacNeill, *Policy Issues Concerning Transfrontier Movements of Hazardous Waste,* in TRANFRONTIER MOVEMENTS OF HAZARDOUS WASTES: LEGAL AND INSTITUTIONAL ASPECTS 7 (OECD ed. 1985) [hereinafter TRANFRONTIER MOVEMENTS].

5 *Id.*

6 *Id.*

7 *Id.*

8 *Id.* (the OECD does not have figures for transport by inland waterway or by air).

9 J. VALLETTE, THE INTERNATIONAL TRADE IN WASTES: A GREENPEACE INVENTORY (1989) [hereinafter GREENPEACE INVENTORY].

10 Wassermann, *Uncontrolled Transport of Nuclear Materials,* 19 J. WORLD TRADE L. 178 (1985).

Notes to Chapter 1

1 Porterfield, Developing Countries Become Developing Dump for Toxics, WORLDPAPER, Dec. 1988 (LEXIS, Nexis library, Currnt File).

2 Hiltzik, *West's Waste Dumping Stirs Africa Controversy,* L.A. Times, June 19, 1988, at 9, col 1.

3 Harden, *Africans Turn to Hostages in Battle Against Foreign Waste,* Wash. Post, July 16, 1988, at A19.

4 Hiltzik, *supra* note 2. Incineration ash is not considered a hazardous waste under U.S. regulations. The government, however, insists on specially constructed landfills for its disposal.

5 *Id.*

6 *Id.*

7 GREENPEACE INVENTORY, *supra* note 9, Introduction.

8 Marshall, *Public Spurs Cleanup; West Europe Has its Fill of Toxic Waste,* L.A. Times, February 28, 1989, at 1, col 1.

9 GREENPEACE WASTE TRADE UPDATE, Dec. 1989.

10 *Greenpeace Says Poland Being Used as Dump for Industrialized Nations' Waste,* 13 INT'L ENV'T REP. (BNA) 438 (1990).

11 GREENPEACE WASTE TRADE UPDATE, *supra* note 9.

12 *Id.*

13 Agreement on the Transboundary Shipments of Hazardous Wastes and Hazardous Substances, Nov. 12, 1986, United States–Mexico, *reprinted in* 26 I.L.M. 25 (1987). Agreement Concerning Transboundary Movements of Hazardous Waste, Oct. 29, 1986, United States–Canada, *reprinted in* 26 I.L.M. 593 (1987).

14 Hunt, *Industry and the Environment* 6; Fin. Times, Mar.16, 1990, at VI.

15 *Id.*

16 *Id.*

17 *Id.*

18 *See supra* note 13.

19 *See* U.S. Environmental Protection Agency (EPA), *EPA's Program to Control Exports of Hazardous Waste,* Report of Audit E1D37–05–0456–80855, at 24 (Mar. 31, 1988).

20 *See Two Men are Indicted in Mexico Dumping,* N.Y. Times, May 11, 1990, at B6, col 6.

21 *See* Handley, *Exports of Waste From the United States to Canada: The How and Why,* 20 ENVTL. L. REP. 10061 (Feb. 1990).

22 Johnson, *Marshall Islands Hope to Profit on Imported Garbage; U.S. Trash May Be Their Treasure,* L.A. Times, May 7, 1989, at 2, col 4.

23 *A Foul Peace Dividend for the Pacific,* ECONOMIST, Oct. 7, 1990, at 36.

24 GREENPEACE INVENTORY, *supra* note 9, Introduction.

25 *See also* Perera, *China and Sudan Want Germany's Nuclear Waste,* NEW SCIENTIST, Sept. 5, 1985.

26 GREENPEACE WASTE TRADE UPDATE, *supra* note 9.

27 *Id.* (for example, in September 1989, the Bahamian government officially rescinded its earlier agreement to burn 88,000 tons of hazardous waste from the United States. At the same time, in Argentina, environmental organizations demonstrated against two proposals to burn foreign wastes. Following the protests, the waste trade plans were cancelled).

28 *See* Basel Convention on the Control on Transboundary Movements of Hazardous Wastes and Their Disposal, Mar. 22, 1989, *reprinted in* UNITED NATIONS ENVIRONMENTAL PROGRAM (UNEP), BASEL CONVENTION ON THE CONTROL OF TRANSBOUNDARY MOVEMENT OF HAZARDOUS WASTES AND THEIR DISPOSAL: FINAL ACT [hereinafter BASEL CONVENTION], *also reprinted in* 28 I.L.M. 649 (1989). For further details on the convention, *see infra* p. 9–10.

29 GREENPEACE WASTE TRADE UPDATE, Apr. 1, 1990.

30 GREENPEACE WASTE TRADE UPDATE, July 15, 1989. *See also* PREVENTION OF DUMPING ACT, 1988, *reprinted in* 29 I.L.M. 208 (1990) (on July 8, 1988 Gambia passed a law establishing strict penalties for dumping local or foreign hazardous wastes in the country. The law sets penalties ranging from a fine of $1.5 million, or five years imprisonment to $7.6 million, or fourteen years imprisonment). *See also* LAW ON TOXIC AND NUCLEAR, *reprinted in* 28 I.L.M. 391 (1989) (according to the law of Ivory Coast, "all acts relating to the buying, selling, importing, transiting, depositing, and stocking of toxic and nuclear waste and noxious substances are forbidden." Anyone committing any of these acts "shall be punished by imprisonment from 15 to 20 years and by fine from 100 million to 500 million francs."). *See also* GREENPEACE INVENTORY *supra* note 9, Introduction (arti-

cle 258 of Haiti's constitution, adopted after the fall of the Duvalier regime, specifies that "no one may introduce into the country wastes or residues of any kind from foreign sources.").

31 GREENPEACE INVENTORY, *supra* note 9, Introduction (for example, Honduras rejected a proposal by a U.S. company to construct an incinerator to burn U.S. toxic wastes. Peru also rejected plans to dispose of incineration ash from the United States. Panama, Sri Lanka, and Taiwan similarly rejected waste import proposals).

32 CM/Res.1153 (XLVIII) (May 23, 1988), *reprinted in* 28 I.L.M. 567 (1989).

33 GREENPEACE WASTE TRADE UPDATE, *supra* note 29.

34 Bamako Convention on the Ban on the Import of All Forms of Hazardous Wastes Into Africa and the Control of Transboundary Movements of Such Wastes Generated in Africa, *reprinted in* 20 ENVTL POL'Y & L. 173 (Sept./Oct. 1990) [hereinafter Bamako Convention]. For more details on this convention, *see infra* p. 10–11.

35 *Id.* at 136–37.

36 GREENPEACE WASTE TRADE UPDATE, *supra* note 9.

37 GREENPEACE WASTE TRADE UPDATE, July 15, 1989 (these countries are Denmark, Netherlands, Italy, Germany, Greece, and Portugal).

38 *Id.*

39 Fourth ACP–EEC convention, signed in Lomé, Dec. 15, 1989, *reprinted in* 29 I.L.M. 809 (1990).

40 GREENPEACE WASTE TRADE UPDATE, *supra* note 37.

41 GREENPEACE WASTE TRADE UPDATE, *supra* note 9.

42 GREENPEACE WASTE TRADE UPDATE, *supra* note 37.

43 Declaration of the Republic of Korea in the Basel Convention, at 20.

44 Sarasohn & Kaplan, *Derailing Limits on Toxic Exports*, Legal Times, Nov.13, 1989, at 5.

45 Devos, *Liability of Transactors for the Movement of Hazardous Wastes*, in TRANFRONTIER MOVEMENTS, *supra* note 4, Introduction, at 249.

46 *See, e.g.*, Shabecoff, *Senator Urges Military Resources be Turned to Environmental Battle*, N.Y. Times, June 29, 1990, at A1, col 1.

47 GREENPEACE INVENTORY, *supra* note 9, Introduction.

48 This does not mean that principles and universal declarations have no value in shaping international policy. *See, e.g.*, Nanda and Bailey, *Nature and Scope of the Problem*, in TRANFERRING HAZARDOUS TECHNOLOGY AND SUBSTANCES 3, 19 (Handl & Lutz ed.1989).

Although the current prescriptions by international bodies are usually in the form of non-binding guidelines and principles, the importance of such non-binding principles in eventually shaping environmental law should not be underestimated. For they allow experimentation and growth, they create community expectations and influence state behavior, and, as happened with the Universal Declaration of Human Rights and Principle 21 of the Stockholm Declaration on the Human Environment, some of these declarations and principles acquire the status of customary international law.

49 Most countries' legislation and planning involves environmental impact assessment (EIA), that is, assessment of the impact on the environment of proposed development projects. In addition, many international organizations, such as OECD, UNEP, and EEC, have adopted guidelines on environmental impact assessment. For an extensive discussion of environmental impact assessment in the international arena, *see* Wirth, *International Technology Transfer and Environmental Impact Assessment,* in TRANFERRING HAZARDOUS TECHNOLOGY AND SUBSTANCES, *id.* at 84. *See also* K.Caldwell, SCIENCE AND THE NATIONAL ENVIRONMENTAL POLICY ACT (1982). For the need to reconcile development with environmental considerations in developing countries, *see, e.g.* Maluwa, *Environment and Development in Africa: An Overview of Basic Problems of Environmental Law and Policy,* 1 AFR. J. INT'L & COMP. L. 650 (Dec. 1989); *U.N. Economic Commission for Africa* (ECA) *Conference of Ministers of African States: Resolutions and Decisions on Environment and Development in Africa,* U.N. Doc. I/B/28–05–84 (1984).

50 *Green Diplomacy,* ECONOMIST, June 16, 1990, at 18. Industries become pro-environment when it serves their purposes. For example, pressure from industry made the U.S. government sign the Montreal protocol on CFCs. In this case, industries knew that most developed countries have decided to phase out the use of CFCs. The same was not true, however, for the developing countries. Therefore, industries were aware that their production of alternative materials would not be able to compete with CFCs cheaply produced in the Third World. A global agreement was necessary.

51 *See, e.g., Administration Split on Global Warming Issue, Officials Say,* N.Y. Times, Feb. 4, 1990, at 32, col 1; *Too Cool on Global Warming,* N.Y. Times, Feb.8, 1990, at A28, col 1; *On Not Flying Into a Greenhouse Frenzy,* N.Y. Times, Nov. 16, 1989, at A30, col 3; *Rethinking the Greenhouse: The Backlash Against Global Warming Has Begun,* ECONOMIST, Dec. 16, 1989, at 14.

52 *See, e.g., Acid Rain: Plenty Bad Enough,* N.Y. Times, Jan. 29, 1990, at A22, col 1.

53 *See* THE COMMITTEE ON THE BIOLOGICAL EFFECTS ON POPULATIONS OF EXPO-

SURE TO LOW LEVELS OF IONIZING RADIATION (BEIR III) 250, 260, 455 (National Academy Press ed.1980). Because of fundamental disagreements many members left the committee and issued separate reports. *See also* Hilts, *Higher Cancer Risk Found in Radiation,* N.Y. Times, Dec. 20, 1989, at A22, col 4 (the latest report of the Committee maintains that the dose received from low-let radiation is four times greater than that estimated in the BEIR III report). Wald, *New Estimates Increase Radiation Risk in Flight,* N.Y. Times, Feb. 19, 1990, at A11, col 1; Wald, *International Panel Urges Cut in Allowable Radiation Dose,* N.Y. Times, June 23, 1990, at 1, col 1.

54 For example, asbestos was considered harmless until it was proven to cause cancer and asbestosis, *see, e.g.,* Stevens, *Scientists Say Risk From Asbestos is Higher Than They Thought,* N.Y Times, June 8, 1990, at B8, col 1. Whether there exists a threshold dose—the dose at which a certain substance becomes harmful—is also contested. Many scientists believe that hazardous substances can be harmful in any amount. For a more extensive discussion, *see* G. W. DAWSON & B. W. MERCER, HAZARDOUS WASTE MANAGEMENT 71–72 (1986); W. W. LOWRANCE, OF ACCEPTABLE RISK: SCIENCE AND THE DETERMINATION OF SAFETY 41 (1943).

55 *See* U.S. Environmental Protection Agency (EPA), *Unfinished Business: A Comparative Assessment of Environmental Problems* (Feb. 1987). *See also* LOW-LEVEL RADIATION: A FACT BOOK (The Society of Nuclear Medicine ed. 1982); Ames, Magaw & Gold, *Ranking Possible Carcinogenic Hazards,* SCIENCE, Apr. 17, 1987, at 271.

56 For example, it would be extremely difficult to convince people who have experienced the impact of the Chernobyl accident—when irradiated milk and fruits were withdrawn from the market—that nuclear power is safe. *See also* C. D. STONE, EARTH AND OTHER ETHICS 256–257 (1988) ("[i]ndeed there is no reason why we should ignore the influence, even the right influence, of most brutal events: famines, plagues, and natural disasters. Do they, too, not shape our planar commitments, enabling us to discern rights and wrongs that we were not able to see before?"). The public is also distrustful of governmental assurances regarding nuclear power because of years of governmental secrecy in these matters, *see* Wald, *Risks to A-Plant Workers Were Ignored, Study Says,* N.Y. Times, Dec. 19, 1989, at A22, col 1; Schneider, *Uranium Miners Inherit Dispute's Sad Legacy,* N.Y. Times, Jan 9, 1990, at A1, col 2; Schneider, *Data for Nuclear Arms Workers Cast Light on 3 Decades of Plutonium Peril,* N.Y. Times, Nov. 18, 1989, at 10, col 1; Schneider, *Scientist Who Managed to 'Shock the World' on Atomic Workers Health,*

N.Y. Times, May 3, 1990, at A20, col 1; Schneider, *Panel Questions Credibility of Nuclear Health Risks,* N.Y. Times, Feb. 28, 1990, at A20, col 5. Finally, the earlier-described uncertainty that underlines environmental issues affects the public's attitude, *see* C. A. WALKER, L. C. GOULD & E. J. WOODHOUSE, TOO HOT TO HANDLE 120 (1983) ("[a] great deal of research indicates that people's beliefs change slowly and are extraordinarily persistent in the face of contradictory evidence.").

57 Emphasizing the prevention of environmental degradation does not mean that decisionmakers would ignore the costs and benefits of "saving the environment" to the detriment of development. This kind of analysis always occurs in the mind of decisionmakers, consciously or subconsciously. However, this analysis is not neutral; it depends, to a large extent, on the predispositions of the person who engages in the analysis. For the significant role that beliefs and predispositions play in the shaping of decisions, *see, e.g.,* J. FRANK, LAW AND THE MODERN MIND (1949).

58 *See supra* note 56.

59 For example, understanding NIMBY syndrome (Not-in-My Backyard) would help decisionmakers address public opposition to waste disposal. Responding to this public opposition in the developed countries would in turn help to eliminate international illegal waste trafficking.

Notes to Chapter 2

1 The term *hazardous materials* (or *hazardous substances*) is more inclusive than the term "wastes": it includes both hazardous products and wastes.

2 The OECD has published Recommendations for member governments regarding existing chemicals and the assessment of the potential effects of new chemicals prior to manufacture, OECD Doc C (74) 215 (Nov.21 1974) and has adopted the "polluter-pays principle," Council Recommendation C (74) 223 (Nov. 14 1974). *See also OECD on the Application of the Polluter Pays Principle to Accidental Pollution,* OECD (89) 88 (Final) (July 25, 1989), *reprinted in* 28 I.L.M. 1320, 1989. The organization has also published recommendations for the transport of hazardous waste. For example, the 1984 Recommendation provided for the exchange of timely and adequate information between exporting and importing countries, and the reimportation of waste in case of illegal transport, OECD Doc. C (83) 180 (Final) (Feb. 1, 1984), *reprinted in* 23 I.L.M. 214 (1984), and the 1986 Recommendation established the prior informed consent rule for

waste exports, OECD Doc. C (86) 64 (Final) (June 5, 1986), *reprinted in* 25 I.L.M. 1010 (1986).

3 According to a U.N. General Assembly Resolution, *Protection against Products Harmful to Health and the Environment,* U.N. Doc. A/Res/37/137 (Mar.3, 1983), banned products may be sold abroad only if the receiving country requests them or their consumption is officially permitted in the importing country. *See also Traffic in and Disposal, Control, and Transboundary Movements of Toxic and Dangerous Products and Wastes,* U.N. Doc. A/Res/44/226 (Dec. 22, 1989) (with respect to the transport of hazardous wastes, the General Assembly "requests each regional commission to contribute to the prevention of illegal traffic in toxic and dangerous products and wastes by monitoring and making regional assessments of this illegal traffic and its environmental and health implications," and asks the executive director of UNEP to establish an ad hoc working group to address the question of liability and compensation left unresolved by the Basel Convention).

4 UNEP's Governing Council adopted resolutions calling upon countries not to permit the export of potentially harmful chemicals, which would be unacceptable domestically, without the consent of the receiving countries, *see, e.g.,* UNEP/G.C 85 (V) (1977). UNEP also adopted the Provisional Notification Scheme for Banned or Severely Restricted Chemicals, which specified how exporting countries should assist importing countries in making timely and informed decisions regarding banned and restricted chemicals, UNEP/G.C. 12/19, Annex I26 (1984).

5 According to a 1984 Directive, countries that export hazardous wastes should inform the countries that import the wastes, 84/631/EE C, O.J. No. L. 326/31 (1984). A 1986 Directive further mandates the prior consent of importing countries, 86/279/EE C, O.J. No.L. 181/13 (1986).

6 *See supra* note 28, Chapter 1. Given the fact that more than fifty percent of all goods transported throughout the world can be classified as dangerous, the International Maritime Organization and the U.N. have promulgated a code regulating the packing and labelling of dangerous goods. It is important to note that radioactive materials are included in the International Maritime Code for Dangerous Goods (IMDG). For more details on the IMDG and the U.N. recommendations on the transport of dangerous goods, *see* S. MANKABADY, THE INTERNATIONAL MARITIME ORGANIZATION 83–102 (1984). *See also* U.N. Committee of Experts on the Transport of Dangerous Goods, U.N. Doc. ST/SG/AC.10/1/Rev. 3. (1984). Another Convention concerned with the transport of dangerous goods is

the European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR), Sept. 30, 1957, 619 U.N.T.S. 77. This agreement provides that the international transport of dangerous goods should comply with certain prescribed conditions for packaging and labelling, and specific requirements for constructing, equipping, and operating the vehicles that carry the goods. However, the parties can still agree to less stringent requirements. Other relevant regulations include the Convention concerning the Carriage of Dangerous Goods by Rail (COTIF), May 1985, and the regulations concerning air transport of dangerous goods promulgated by the International Civil Aviation Organization, Annex 18 to the Convention on International Civil Aviation, the Safe Transport of Dangerous Goods by Air, July 1989.

7 *See supra* note 34, Chapter 1.

8 Under Belgian law, for example, only hazardous materials with no further use are considered wastes, and recyclable materials are therefore not included. Under Norwegian law, in contrast, even substances that have economic value or may be recycled are considered wastes. Nevertheless, once such substances are actually recycled, they cease to be wastes. Under English law, by-products that are reused in other activities do not fall under the legal definition of wastes. In fact, the applicability of waste regulations depends on the present status of the substance in question. What was considered waste at the production stage may cease to be so because, for instance, a new recycling process has since become available. Under Japanese law, recyclable wastes are categorically excluded. For further details on national differences in the definition of hazardous wastes, *see* OECD, INDENTIFICATION OF RESPOSIBILITIES IN HAZARDOUS WASTE MANAGEMENT 11–14 (1985) [hereinafter INDENTIFICATION OF RESPOSIBILITIES].

9 For example, Annex I includes clinical wastes from medical care, wastes from the production and preparation of pharmaceutical products, and waste materials contaminated with polychlorinated biphenyls (PCBs). Also included are wastes that have such constituents as copper compounds, arsenic compounds, mercury, and lead. In Annex III, wastes are classified according to their characteristics: explosive, flammable, corrosives, ecotoxic, and the like.

10 73/319/EE C, O.J. No. L. 84/43 (1978).

11 *See* INDENTIFICATION OF RESPOSIBILITIES, *supra* note 8, at 12–13. In most cases, these definitions are vague and rely on lists of various types of waste. The criteria suggested by these lists are typically: the type of hazard involved, such as flammability, corrosiveness, and toxicity; the generic category of the products, such as

pesticides, solvents, and medicines; the technological origins of the materials, such as oil refining and electro-plating; and the presence of specific substances, such as PCBs, dioxins, and lead compounds.

12 To realize how important updating is, one should note that numerous new and potentially hazardous chemicals enter the market daily, *see,e.g., Managing Hazardous Wastes: The Unmet Challenge,* WORLD RESOURCES 201, 203 (1987).

13 Art. 4, para. 1(c).

14 Art. 4, para. 2(e).

15 Art. 4, para. 8(a), (b).

16 Art. 8.

17 Art. 9, para. 2.

18 Art. 9, para. 5.

19 Art. 12. The convention in article 14 does propose the establishment of a revolving fund to provide interim assistance for accidents that occur during the transnational movement of wastes and their disposal. The parties to the convention have also agreed to establish regional and subregional centers for the transfer of training and technology concerning hazardous waste management (art. 14), as well as a secretariat whose main function is to provide information and assist states in the cross-border movement and management of wastes (art. 16).

20 Art. 11, para. 10.

21 Art. 4, para. 1.

22 Art. 2.

23 Art. 4, para. 2.

24 Art. 4, para. 3(b).

25 Art. 4, para. 3(c).

26 *Id.*

27 Art. 4, para. 3(f) ("[e]ach party shall strive to adopt and implement the preventive, precautionary approach to pollution problems which entails, inter-alia, preventing the release into the environment of substances which may cause harm to humans and the environment without waiting for scientific proof regarding such harm.").

28 Art. 4, para. 3(g).

29 Art. 8.

30 Art. 9.

31 Art. 9, para. 2.

32 *Id.*

33 Art. 12.

34 Art. 4, para. 1(b), para. 4(a).

35 *See, e.g.*, Gündling, *Prior Notification and Consultation*, in TRANSFERING HAZARDOUS TECHNOLOGIES AND SUBSTANCES, *supra* note 48, Chapter 1, at 63.

36 *Id.* at 74. ("[t]reating transfrontier movements of hazardous waste differently from exports of hazardous chemicals is not justifiable. But, as far as the latter are concerned, industrialized states do not seem prepared to accept international controls, and certainly not the requirement of prior informed consent.").

37 *See* Yakowitz, *Harmonization of Specific Descriptors of Special Wastes Subject to National Controls in Eleven OECD Countries* in TRANFRONTIER MOVEMENTS, *supra* note 4, Introduction, at 50.

38 *Id.*

39 Excerpt of Law on the Transfrontier Disposal of Industrial Waste (Nov 9, 1988), *reprinted in* 28 I.L.M. 393 (1989).

40 *See, e.g.*, U.S. General Accounting Office (GAO), *Assessment of EPA's Hazardous Waste Enforcement Strategy*, GAO/RCED–85–166 (Sept.5, 1985).

41 *See, e.g.*, U.S. General Accounting Office (GAO) *Hazardous Waste: EPA Has Made Limited Progress in Determining the Wastes to be Regulated*, GAO/RCED–87–27 (Dec. 1986); U.S. General Accounting Office (GAO) *Hazardous Waste: Uncertainties of Existing Data*, GAO/PEMD–87–11BR (Feb. 1987).

42 *See Five More Countries Sign the Basel Convention Just Before Deadline*, 13 INT'L ENV'T REP. (BNA) 147 (1990). The three countries that have ratified the convention are Jordan, Saudi Arabia, and Switzerland. The convention will take effect when twenty governments have ratified it.

43 *Id.*

44 International Atomic Energy Agency (IAEA): General Conference Resolution on Code of Practice on the International Transboundary Movement of Radioactive Waste, *reprinted in* 30 I.L.M. 556 (1991).

45 *Id.*

46 *See* INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA), REGULATIONS FOR THE SAFE TRANSPORT OF RADIOACTIVE MATERIAL (SAFETY SERIES NO. 6, 1985 & SUPP. 1986).

47 *Id.* at 53.

48 U.N. Doc. A/Res/43/75 T (Dec. 7, 1988).

49 U.N. Doc. A/Res/44/116 R (Dec. 15, 1989).

50 *See, eg., infra* note 54.

51 The issue of radioactive waste transport has been a subject of communications

between the European Commission and the European Parliament and Council. Given the estimated increase in future radioactive waste transports, the Commission considers it necessary to limit both the number and, as far as possible, the distance travelled between nuclear power stations, reprocessing plants, and storage and disposal centers, *see Proposal for a Council Decision Adopting a Programme on the Management and Storage of Radioactive Wastes,* COM (84) 233 Final (1984). *See also Proposal for a Council Decision Adopting a Specific Research and Technical Development Programme for the European Atomic Energy Community in the Field of Management and Storage of Radioactive Waste* (1990–94), COM (89) 226 Final (1989).

52 For a more extensive discussion of the conventions, *see* Chapter 4.

53 *See generally infra* note 13, Chapter 3. *See also* Lippman, *Chernobyl Contamination Still Spreading, Soviet Says,* Wash. Post, July 5, 1991, at A8.

54 G. D. BURHOLT & A. MARTIN, THE REGULATORY FRAMEWORK FOR STORAGE AND DISPOSAL OF RADIOACTIVE WASTE IN MEMBER STATES OF THE EUROPEAN COMMUNITY 3 (1988) (the categories are: (1) high-level, long-lived; (2) intermediate-level, long-lived; (3) low-level, long-lived; (4) intermediate-level, short-lived; and (5) low-level, short-lived).

55 *Id.* at 89, 108 (this point is illustrated by the different approach of the United States, where everything that is not spent nuclear fuel is deemed to be low-level radioactive waste, and Britain, which distinguishes between very low-level and low-level radioactive wastes).

Notes to Chapter 3

1 *See supra* p. 11.

2 *See supra* note 36, Chapter 2.

3 For example, the introduction to the *Provisional Notification Scheme for Banned or Severely Restricted Chemicals,* UNEP/G.C. 12/19, Annex I 26 (1984), provides that in the case of pesticides, "the fact that a product is not used or registered in a particular exporting country is not necessarily a valid reason for prohibiting the export of that pesticide. Developing countries are mostly situated in tropical or semi-tropical regions. Their climatic, ecological, agronomic, social, economic and environmental conditions and therefore their pest problems are usually quite different from those prevailing in the countries in which pesticides are manufactured and exported." The dimensions of the AIDS epidemic in Africa also may warrant extensive use of experimental drugs, *see, e.g.,* Altman, *W.H.O. Says 40 Million Will be Infected with the AIDS Virus by 2000,* N.Y. Times, June 18, 1991, at

C3, col 1. ("[b]y 2000, there will be 10 million cases of AIDS worldwide, ninety percent of them in developing countries, principally among the impoverished....").

4 The Association of the Bar of the City of New York, Committee on International Human Rights, Toward the Development of a Response to the Problem of Hazardous Exports (Feb. 1984) (for example, Leptophos is a pesticide that has never been registered by the EPA for use in this country. It was manufactured for export to fifty other countries. In 1971 and 1972, Egyptian farmers began suffering from hallucinations and impaired vision and speech after using Leptophos).

5 *See* preamble of the Basel Convention, which acknowledges the need to harmonize the IAEA Code—under preparation when the Basel Convention was signed— with the provisions of the convention. Only the OAU seems to support that the rules for the transport of hazardous and radioactive wastes should be the same. The overall position of the organization, however, is oriented toward prohibition rather than control.

6 *See, e.g.*, TRANSFERRING HAZARDOUS TECHNOLOGIES AND SUBSTANCES, *supra* note 48, Chapter 1, at vii (it is discussed that nuclear transfers involve concerns similar to hazardous transfers, however, it is maintained that nuclear transfers "are already subject to an established set of idiosyncratic international legal rules and principles. Present international legal issues arising over nuclear technology transfers are consequently quite different in nature from those encountered in the case of other, still largely unregulated, hazardous transboundary transfers.").

7 *See* R. BERTELL, NO IMMEDIATE DANGER: PROGNOSIS FOR A RADIOACTIVE EARTH 31 (1985).

8 BURHOLT & MARTIN, *supra* note 54, Chapter 2, at 89 (in Britain, it is possible to dispose of very low radioactive wastes with solid wastes.) *See also* Wald, *Disposal of Mild Radioactive Waste To be Less Restricted in New Policy*, N.Y. Times, June 26, 1990, at A12, col 1. *See also* the U.S. General Accounting Office (GAO), *Environmental Funding: DOE Needs to Better Identify Funds for Hazardous Waste Compliance* GAO/RCED 88–62, (Dec. 1987) (the DOE generates mixed waste, which contains both radioactive and hazardous substances. The mixed waste generally comes from DOE's nuclear defense production facilities where spent nuclear reactor fuel is chemically processed to extract residual uranium and plutonium for reuse).

9 Schneider, *2 Suits on Radium Cleanup Test Oil Industry's Liability*, N.Y. Times,

Dec. 24, 1990, at 9, col 1 ("[t]he lawsuits may ultimately decide whether oil companies can be held responsible for billions of dollars in expenses associated with cleaning up and disposing of radioactive wastes at thousands of oil and gas sites around the nation.").

10 Verkerk, *Waste Disposal in Europe—Looking Ahead,* in RADIOACTIVE WASTE MANAGEMENT AND DISPOSAL 16, 20 (Cambridge University Press for the Commission of the European Communities ed. 1985).

11 *See, e.g.,* Howe, *Taiwan Calling China's Bluff with Nuclear Program,* Kyodo News Service, Nov. 23, 1991 (LEXIS, Nexis library, Currnt File) ("Taiwan Foreign Minister Frederick F. Chien . . . wanted to assure Beijing that Taiwan was not reprocessing any spent fuel from its five nuclear power reactors into weapons fuel."); The Daily Telegraph, Nov. 18, 1991, at 16 (LEXIS, Nexis Library, Currnt File) ("[a]ccording to intelligence reports, the most worrying aspect of the North Korean nuclear project in Yongbyon, north of the capital, is work on a reprocessing plant to turn nuclear waste into weapons-grade plotonium."); Xinhua General Overseas News Service, Nov. 1, 1991 (LEXIS, Nexis Library, Currnt File) (Britain has agreed to treat Iraq's nuclear wastes contributing to the international efforts to halt its weapons program. Otherwise, the wastes, if suitably processed, could be used to make nuclear warheads).

12 Israel, South Africa, Pakistan, India, and Argentina have not signed the Nuclear Nonproliferation Treaty.

13 In the case of hazardous wastes, the best way to deal with the excessive waste stream is to minimize wastes at the source of production. Recycling and incineration are currently available. Even these methods, however, are not without defects: incineration causes air pollution, and the incineration ash is itself a hazardous substance. On the other hand, the market for recycled products is very limited in developed countries. Other methods, such as biotechnology, are in the experimental stage. Landfill disposal is considered ineffective because it contaminates groundwater, although guidelines have been promulgated for safe landfill disposal. These include among others, pretreatment of the wastes, monitoring of the sites, and exclusion of liquid wastes. Some countries are contemplating the abolition of landfill disposal for most hazardous wastes. For an extensive discussion of the methods of hazardous waste management, *see generally* K. BROWN, G. B. EVANS & B. D. FRENTRUP, HAZARDOUS WASTE LAND TREATMENT (1983); M. SITTING, LANDFILL DISPOSAL OF HAZARDOUS WASTE AND SLUDGES (1979); C. B. COPE, W. H. FULLER & S. L. WILLETS, THE SCIENTIFIC

MANAGEMENT OF HAZARDOUS WASTES (1983); G. W. DAWSON & B. W. MERCER, HAZARDOUS WASTE MANAGEMENT (1986); AND M. A. SMITH, CONTAMINATED LAND: RECLAIMATION AND TREATMENT (1985).

In the case of high-level radioactive wastes, deep geologic disposal is recognized as the ultimate solution. In many countries, however, the naming of a permanent disposal site stirs public opposition, because people do not want radioactive wastes in their own backyards. In the Netherlands, the possibility of an international waste repository is being studied.

There is disagreement on what constitutes sound management of low and intermediate levels of radioactive wastes. Low-level nuclear wastes are not as harmless as their name suggests; they may contain *hot spots*, where the concentration of radioactivity is quite high. For this reason, geological disposal is the preferred option in Germany and Britain, even for low-level waste disposal. However, in most countries, low-level wastes are buried in near-surface facilities. As an alternative, environmental groups propose above-ground storage facilities with leakage collection systems, the method used in the Netherlands.

Countries also disagree on the proper reprocessing of spent fuel. While some favor domestic or foreign reprocessing, others oppose reprocessing altogether. For example, the United States has deferred commercial reprocessing and is presently holding its fuel in storage in nuclear power plants. For an extensive discussion of radioactive waste management, *see generally* R. D. LIPSCHUTZ, RADIOACTIVE WASTE: POLITICS, TECHNOLOGY, AND RISK (1980); D. L. BARLETT & J. B. STEELE, FOREVERMORE: NUCLEAR WASTE IN AMERICA (1985); LONG-TERM MANAGEMENT OF RADIOACTIVE WASTE: LEGAL, ADMINISTRATIVE, AND FINANCIAL ASPECTS (OECD ED.1984); AND G. D. BURHOLT & A. MARTIN, THE REGULATORY FRAMEWORK FOR STORAGE AND DISPOSAL OF RADIOACTIVE WASTE IN MEMBER STATES OF THE EUROPEAN COMMUNITY (1988).

14 Environmentalists claim that by trading wastes, developed countries take advantage of Third World underdevelopment and financial need. For this reason, they argue, the transnational movement of wastes is immoral and should be banned. It is true that ethical considerations influence the shaping of environmental law, *see infra* note 33, Chapter 4. While international policy is rightly influenced by moral considerations, however, it cannot afford simply to copy moral dictates, because policy recommendations must take the defects of human nature into account and cannot only challenge them.

15 *See, e.g.*, supra p. 3–4.

16 *See* Bassiouni, *Critical Reflections on International and National Control of Drugs*, 18 DEN. J. INT'L L. & POL'Y 311, 334 (1990) ("[i]n Zurich's main park there is even free distribution of needles to heroin addicts as a way of reducing AIDS and other health hazards. While in Frankfurt an area of the city operates free of police interference with the sale and use of drugs.").

17 *See, e.g.*, Perlez, *Devaluating the Tusk*, N.Y. Times, Jan 7, 1990, §6 (Magazine), at 30; Banning the Ivory Trade Will Harm Elephants, Not Help Them, ECONOMIST, Oct. 14, 1989, at 19; *Ivory? Poached? Moi?*, ECONOMIST, Oct. 13, 1990, at 92; Meir, *Tracing Illegal Ivory: Forensic Scientists Take On Smugglers*, N.Y. Times, Oct. 29, 1991, at C4, col 1 (only lately with the development of DNA fingerprinting has the ban on elephant ivory trade become effective. However, as one scientist involved in the project has emphasized: "People have shifted from killing elephants to killing hippos. The ivory trade hasn't stopped, only the killing of elephants has.").

18 2 S. MANKABADY, THE INTERNATIONAL MARITIME ORGANIZATION: ACCIDENTS AT SEA 5 (1987).

19 *Id.* ("[i]n 1984 the [Maritime Safety Committee] MSC noted that the reports submitted by flag states vary considerably in size and detail and that in some cases they did not indicate that an official investigation had been conducted.").

20 S. MANKABADY, THE INTERNATIONAL MARITIME ORGANIZATION 82 (1984), the author argues that the success of the IAEA rules is proved by the fact that few accidents have occurred during the transportation of nuclear materials. Environmentalists, however, fear that accidents occur more frequently than is reported, a possibility that is especially plausible because the release of radioactivity is not as obvious as a chemical or an oil spill. For a more extensive discussion on the dangers involved in the transport of nuclear materials, *see* Wassermann, *supra* note 10, Introduction.

21 *See, e.g.*, M. RESNIKOFF, THE NEXT NUCLEAR GAMBLE 24 (1983) (only 11 to 20 percent of hazardous materials accidents are actually reported to the U.S. Department of Transportation).

22 This lack of safety is corroborated by the extensive international and national legislation governing the transport of dangerous goods. *See supra* note 19, Chapter 2.

23 *See* Handley, *supra* note 21, Chapter 1, at 10064 ("[t]o date, the bulk of U.S. hazardous waste export traffic has originated in the northern border states and is bound for the Stablex and Tricil facilities in southern Canada. This suggests that a lower cost of transport due to Canada's geographic proximity, rather than a

desire to avoid legal requirements, has been the prevalent reason for most of the hazardous waste exports to Canada."); *See also Norway, Sweden to Form Joint Company to Manage Disposal of Hazardous Waste*, 13 INT'L ENV'T REP. (BNA) 438 (1990) ("Norway and Sweden will form a joint company to own and operate the two countries' hazardous wastes plants.... The projected Norwegian waste site will receive about 15,000 tons of Swedish waste, in addition to the expected Norwegian contribution of 35,000 metric tons.").

24 There are, of course, developing countries whose economies are oriented principally toward the development of agriculture or tourism.

25 For the deficiencies of landfill disposal, *see supra* note 13. *See also* Patrick, *Metropolitan Waste Management Planning in Developing Countries* in MANAGING SOLID WASTES IN DEVELOPING COUNTRIES 37, 42 (Holmes ed. 1984) [hereinafter MANAGING SOLID WASTES] (although waste exports to developing countries are sometimes justified by the argument that these countries have vast areas of open land that the first world lacks, "the difficulties of finding suitable and acceptable sites for landfill disposal in developing countries are often no less than in Western Europe, despite the apparent availability of great areas of non-urban land. Village dwellers are no more willing than their town or city counterparts to have waste disposal facilities in their neighborhood. Water supply for rural areas is often from wells, so groundwater protection is important.").

26 Pickford, *The Solid Waste Problems of Poor People in Third World Cities* in MANAGING SOLID WASTES, *supra* note 25, at 29, 30 ("[t]hese people lack adequate nutrition, education, or health care. Most of them are without a safe clean water supply or reasonable sanitation.... Many have to queue for a trickle of water from a public standpost or to distant pools or streams or wells for polluted water.").

27 Wellings, *Management of Solid Wastes from Industry in Developing Countries*, in MANAGING SOLID WASTES, *supra* note 25, at 127, 137.

28 *Id. See also* Oluwande, *Assessment of Solid Waste Management Problems in China and Africa*, in MANAGING SOLID WASTES, *supra* note 25, at 71, 86.

29 *See* Vogler, *Waste Recycling in Developing Countries: A Review of the Social, Technological, and Market Forces*, in MANAGING SOLID WASTES, *supra* note 25, at 241, 266 (according to Volger, the benefits of developing and expanding a reclamation industry in developing countries are: "[s]avings in foreign exchange by substituting locally collected wastes for imported raw materials; savings in energy consumption by industry which requires far less energy to manufacture from wastes than from primary raw materials; reduction of waste collection and disposal

demands on municipalities; a reduction of litter as wastes are given a cash resale value. However, the creation of employment is far more important than any of these.").

30 *Id.* at 254 (every month the U.S. imports some 500 tons of newly rolled steel from India. The reason why is that India can produce steel at a low price because it is re-rolled from scrap. On the other hand, re-rolling is almost unknown in the industrialized countries. Re-rolling also helps India to relieve its unemployment rate).

31 *Id.* at 257–58 (while the developed world is striving to develop economic plants to pyrolize motor car tires and ban them from dumps, India is suffering from a shortage of scrap tires. For this reason, in 1979, the Chief Executive of the largest Indian reclaiming rubber plant visited Europe to seek additional supplies of scrap tires. Unfortunately, the costs of shipping tires from Europe to India turned out to be very high, and the whole plan failed).

32 *Id.* at 251. *See also* Wellings, *supra* note 27, at 133.

33 *See supra* note 29.

34 EPA, *supra* note 19, Chapter 1 at 5 ("[t]he EPA is aware of evidence that certain materials exported ostensibly for recycling were actually sham recycling and resulted in potential risk to health and the environment in the receiving country.").

Notes to Chapter 4

1 *See supra* p. 9–10, 13.

2 *OECD Decision of the Council on Transfrontier Movements of Hazardous Wastes,* OECD C (88) 90 (Final), (1988), *reprinted in* 28 I.L.M. 257 (1989). This OECD decision recommends the adoption of an International Waste Identification Code. One of the requirements of the code would be to "indicate the method which has been selected for the disposal of wastes by choosing the *one* operation from Table 2 which most closely describes the fate intended for the wastes." However, Table 2 "is meant to encompass all such disposal operations which occur in practice whether or not they are adequate from the point of view of environmental protection." In other words, it does not designate the current best available technology.

3 *See infra* p. 22.

4 *See supra* note 8, Chapter 2.

5 *See* C. B. COPE, W. H. FULLER & S. L. WILLETS, THE SCIENTIFIC MANAGEMENT OF HAZARDOUS WASTE 25 (1983) ("[t]he growth of recycling activities is a

political development rather than an industrial one, and in the absence of external subsidies (e.g. government loans, tax incentives or voluntary contributions), the future of recycling is very limited."). *See also* Gold, *E.P.A. Offers a Compromise Rule to Promote Recycling of Garbage*, N.Y. Times, Dec.1, 1989, at A30, col.1; Holusha, *Newspapers Promise to Use More Recycled Paper*, N.Y. Times, Dec. 18, 1989, at B5, col 1.

6 *See supra* note 13, Chapter 3.

7 *Id.*

8 *See* Report by the Comptroller General of the United States, *Hazardous Waste Disposal Methods: Major Problems with their Use*, CED–81–21, at 3 (Nov. 19, 1980) (for example, EPA has estimated that tens of millions of tons of hazardous waste are disposed of annually and that about 94,000 landfills and 173,000 surface impoundments are used for waste disposal in the United States).

9 GAO, *supra* note 40, Chapter 2, at 3 ("[c]ompliance is dynamic in nature because many facilities will go in and out of compliance, which will lower the percentage of facilities in compliance at any given time.").

10 Unannounced visits are better than routine visits because the waste generators cannot adjust their compliance practices for the purpose of the imminent visit.

11 *See supra* p. 21.

12 For a more extensive discussion of the fund, *see infra* p. 26.

13 The notion of financial compensation to Third World countries for complying with international environmental regulations has already been applied. For example, financial assistance will be supplied to developing countries which will take measures to protect the ozone, *see, e.g.*, Shabecoff, *U.S. To Back Fund To Protect the Ozone*, N.Y. Times, July 16, 1990, at 1, col 5.

14 For the persistent need for financial aid to Third World countries, *see, e.g.*, Lewis, *Poorest Countries Seek Increase in Aid,* N.Y. Times, July 3, 1990, at A3, col 4.

15 This should be the function of tort law from the law and economics point of view. However, according to the autonomy-consent theory, the aim of tort law is not to promote efficiency, but to redress assaults upon autonomy. Under those circumstances, compensation is viewed in terms of rights and duties between victims and wrongdoers.

16 This concept of society is an instrumental one. Society, however, comprises different social groups with different perceptions of what is dangerous and socially desirable. Thus, the premises of any cost-benefit analysis could justifiably be challenged by different social groups.

17 Convention on the Liability of Operators of Nuclear Ships, May 25, 1962, *reprinted in* 1 INTERNATIONAL PROTECTION OF THE ENVIRONMENT 405 (Rüster & Simma ed. 1975).

18 Art. 2, para.1.

19 Art. 3, para.1.

20 Convention on Civil Liability for Oil Pollution Damage, Nov. 29, 1969, 973 U.N.T.S. 3, *reprinted in* 9 I.L.M. 45. *See also* Protocol to the 1969 International Convention on Civil Liability for Oil Pollution Damage, Nov. 19, 1976, *reprinted in* 16 I.L.M. 617.

21 Article 6 provides: "For the purpose of availing himself of the benefit of limitation provided in paragraph 1 of this Article the owner shall constitute a fund for the total sum representing the limit of his liability ..."

22 Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, Dec. 18, 1971, *reprinted in* 66 AM. J. INT'L L. 712. *See also* Protocol to Amend the 1971 International Convention of the Establishment of an International Fund for Compensation for Oil Pollution Damage, Nov. 19, 1976, *reprinted in* 16 I.L.M. 621.

23 Convention on Third Party Liability in the Field of Nuclear Energy, July 29, 1960, 1041 U.N.T.S. 358.

24 Convention on Civil Liability for Nuclear Damage, May 21, 1963, 1063 U.N.T.S. 265.

25 *See supra* note 23, art. 4. *See id.* art. 2.

26 For example, the United States and countries that have recently developed nuclear facilities, such as India and Israel, have not signed the Paris Convention. France, Sweden, Great Britain have ratified the Paris Convention. The Vienna Convention has not been signed by any major nuclear power.

27 *See* Pelzer, *Concepts of Nuclear Liability Revisited: A Post-Chernobyl Assessment of the Paris and the Vienna Conventions* in NUCLEAR ENERGY LAW AFTER CHERNOBYL 97, 108 (Cameron, Hancher & Kühn ed. 1988).

28 *Id.* These states include Bulgaria, Hungary, Germany, Japan, Poland, and Switzerland.

29 Convention Supplementary to the 1960 Convention on Third Party Liability in the Field of Nuclear Energy, Jan. 31, 1963, 956 U.N.T.S. 264.

30 *See id.* art. 3.

31 Contract Regarding an Interim Supplement to Tanker Liability for Oil Pollution (CRISTAL), *reprinted in* 2 INTERNATIONAL PROTECTION OF THE ENVIRONMENT 490 (Rüster & Simma ed. 1975).

32 *See also European Chemical Industry Says EEC Draft Misinterprets Principle of "Polluter Pays"*, 13 INT'L ENV'T REP. (BNA) 236 (1990) (this kind of liability is proposed by the European Commission. Industry's opposition is well summarized by the European Chemical Industry Federation: "Strict liability channelled onto the producer, the concept of injury to the environment and compensation, joint and several liability, the facilitation of the burden of proof, and the responsibility for third persons coupled with the non-existence of ceilings of liability transform the polluter pays principle into a producer pays principle.").

33 L. K. CALDWELL, SCIENCE AND THE NATIONAL ENVIRONMENTAL POLICY ACT: REDIRECTING POLICY THROUGH PROCEDURAL REFORM 20 (1989).

> The environmental movement has been directed toward reform and hence has had a moral and ethical content, its underlying assumption being that it is inherently wrong to impair especially unnecessarily the quality of the environment. This moral and ethical bias toward quality is evident in the literature of environmental protection issues, and has made compromise difficult in many environmental controversies. From the perspective of environmental protectionists, and equally perhaps from the different perspectives of their opponents, the choices are clearly between right and wrong.

34 An example that financial settlements cannot effectively work in the case of environmental disputes is the Bhopal case. This is so because of the emotional and moral issues involved. *See India Seeks to Reopen Bhopal Case*, N.Y. Times, Jan. 22, 1990, at D1, col 3; *India Assails Bhopal Pact*, N.Y. Times, Nov. 21, 1990, at D8, col. 6; *Indian Government Ends Speculation, Announces Support for Bhopal Challenge*, 13 INT'L ENV'T REP. (BNA) 511 (1990) ("[t]he Indian Government has told Attorney General Soli Sorabjee to support review petitions challenging the controversial $470 million Bhopal settlement.").

35 Most of the national and international adjudicatory systems we are familiar with are time-consuming.

36 *See* McCaffrey, *The Work of the International Law Commission Relating to Transfrontier Environmental Harm*, 20 N.Y.U. J. INT'L L. & POL. 715 (1988).

37 *See, e.g., Fourth Report on the Content, Forms and Degrees of International Responsibility*, [1983] 2 Y.B. INT'L L. COMM'N 3, U.N. DOC. A/CN.4/366 and Add.1.

38 A frequently cited treaty in which the payment of damages is included in the primary obligation is the Convention on the International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T. 2389, T.I.A.S. No. 7762. Article 2 of the treaty states: "A launching State shall be absolutely liable to pay

compensation for damage caused by its space object on the surface of the earth or to aircraft on flight." Two arbitral decisions are also cited as examples of the implementation of the concept of international liability: The Trial Smelter (U.S. v. Can) 3 R. Int'l Arb. Awards 1905 (1938 & 1941), and the Lake Lanoux (Fr. v. Spain), 12 R. Int'l Arb. Awards 281 (1957). It should be noted, however, that these decisions do not use the term international liability.

39 *Third Report on International Liability for Injurious Consequences Arising Out of Acts Not Prohibited by International Law, Schematic Outline*, [hereinafter, *Schematic Outline*], at 25, U.N. Doc. A/CN. 4/360 (1982) (the withholding of information is, however, permitted when it is "necessary" for reasons of national or industrial security. There is also an advisory fact-finding mechanism that requires the source state to cooperate when the affected state proposes fact-finding).

40 *See, e.g., id.* at 23, 26. *See also First Report on International Liability for Injurious Consequences Arising Out of Acts Not Prohibited by International Law*, at 20, 22, U.N. Doc. A/CN. 4/402 (1986) [hereinafter, *First Report*].

41 *See, e.g., Schematic Outline, supra* note 39, at 26–27, 28–29.

42 *First Report, supra* note 40, at 24–25, U.N. Doc. A/CN. 4/402 (1986) (Rapporteur Barboza states that "[i]t goes without saying that these forms of absolute liability, which are so strict in attributing consequences to the source state, would be appropriate only in conventions on specific and very dangerous activities, but not in a general regime as the one we are considering."). *See also Second Report on International Liability for Injurious Consequences Arising Out of Acts Not Prohibited by International Law*, at 4, U.N. Doc. A/CN. 4/ 346/Add. 1 (1981).

43 Handl, *Liability as an Obligation Established by a Primary Rule of International Law*, XVI NETH. Y. INT'L L. 49 (1985).

44 *Id.* at 71.

45 Even the rapporteurs accept this deficiency in the notion of international liability. *See First Report, supra* note 40, at 2 ("[w]ith regard to the French language, since *responsabilité* was the only available word, it would be used for both meanings. It should also be added that Spanish, which is also an official language of the United Nations, does not make the same distinction as English, and the only available term is *responsabilidad.*"). *See also Schematic Outline, supra* note 39, at 16.

46 Boyle, *State Responsibility and International Liability for Injurious Consequences of Acts Not Prohibited by International Law: A Necessary Distinction?* 39 INT'L & COMP. L.Q. 1, 9 (1990) ("[t]he most common use of "responsibility" is to refer to the obligations of States, and "liability" to refer to the consequences which ensue from breach of those obligations.").

47 I. BROWNLIE, SYSTEM OF THE LAW OF NATIONS, STATE RESPONSIBILITY 50 (1983).

48 Magraw, *Transboundary Harm: The International Law Commission's Study of "International Liability,"* 80 AM. J. INT'L L. 305, 318 (1986). *See also* Akerhust, *International Liability for Injurious Consequences Arising out of Act Not Prohibited by International Law*, XVI NETH. Y.B. INT'L L. 4, 15 (1985).

49 *Fourth Report on International Liability for Injurious Consequences Arising out of Acts Not Prohibited by International Law*, at 3, U.N. Doc. A/CN. 4./413 (1988) [hereinafter *Fourth Report*].

50 For a discussion of the application of developments in municipal tort systems to the concept of international liability, *see* Gaines, *International Principles for Transnational Environmental Liability: Can Developments in Municipal Law Help Break the Impasse*, 30 HARV. INT'L L.J. 311 (1989).

51 *Fourth Report*, *supra* note 49, at 17–18 n. 11.

52 *First Report*, *supra* note 40, at 17, U.N. Doc. A/CN. 4/402 (1986).

53 *Id.* at 17. *See also Fourth Report*, *supra* note 49, at 5. *But see* Handl *supra* note 43, at 64. According to Handle, accidents are within the sphere of international liability while continuous and intentional harm is within the realm of state responsibility.

54 *See supra* p. 27.

55 Interests are balanced not only in cases of international liability but in every Court decision. *See also*, Boyle, *supra* note 46, at 18.

56 The ICJ is one of the possible transnational fora that could handle issues of state responsibility and international liability.

57 *See, e.g.*, M. KOSKENNIEMI, FROM APOLOGY TO UTOPIA (1989).

58 States do have an interest in proving that the activity was wrongful, because damages are higher in cases of wrongful activity. *See also* Akehurst, *supra* note 48.

59 *See* Magraw, *supra* note 48, at 322.

60 *Id.* at 318. *See also* Akehurst, *supra* note 48, at 11.

61 Magraw, *International Legal Remedies*, in TRANSFERRING HAZARDOUS TECHNOLOGIES AND SUBSTANCES 240, 254.

62 *See, e.g.*, Trial Smelter, *supra* note 38. Principle 22 of the Stockholm Declaration, providing that "states shall cooperate to develop further the international law regarding liability and compensation for the victims of pollution and other environmental damage caused by activities within the jurisdiction or control of such states to areas beyond their jurisdiction," seems to be broader because it refers to activities that are within the jurisdiction and control of the source state.

63 State responsibility cannot, however, resolve the question of who will be responsible in case of future accidents when the present nation-state will not exist. Such future accidents are possible, because high-level radioactive wastes and many hazardous substances will be harmful for thousands of years.